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BIRD NOTES

from

40 Selborne Drive

Piedmont, California

1933 to 1939

by

Ernest I. Dyer

PART V

January 1, 1936, to December 31, 1936 . . . . pp. 1102-1332

(last part of Dec. 31 is bound in Part VI,

on p. 1333)

Subject: mainly Thrashers, Road-runners

with nineteen pages of illustrations

ROADRUNNERS

(Notes on Bryant's contribution to Vol.17, No.5, Oct.1916 of University of California Pub. in Zoology).

To my personal knowledge these birds are being shot now in Santa Barbara Co. on account of there alleged destruction of quail.

Copy to Dr. Linsdale

P.25 line 1. All ten rectrices, except when tips are worn off, are tipped with white. (Comparisons herein are with "my" birds:

1, Rhody a free, resident adult at my home every day (with few exceptions) since Apr.15 1934. Takes food from hand, and

2, Archie, his 9 month old offspring under observation in confinement, and

3, Terry, nest-mate of Archie, in same outdoor cage, and

4, Circe, Rhody's mate of 1935, mother of A and T, wild and free, not seen since July 1935 and before that only a few times.

Par. 1. Colors of skin patch. Scarlet, white, bluish white, Blue (from ultramarine to very light), purplish slate. (In Archie, probably temporarily, due to bruise on back of head, there is greenish white on one side at present (Feb.21,1936). (Above colors not checked with any color standards, such as Ridgeway's).

Par.2. Formerly common between Berkeley and Oakland 40 years ago (Dr. Chester H. Woolsey).
Ditto about Santa Rosa some years ago. (Dr. and Mrs. J.W.Scamell).

" Statement re scarcity in San Joaquin Valley a surprise. They are common now in the vicinity of Coalinga and Kettleman Hills on west side of valley in Fresno and (probably) Kings Co's. (D.D.Champion, now resident in Coalinga, and making frequent trips by auto between points noted).

P.26, middle par.

4 nests by Rhody in 1935, only one completed. First in Catalina Ironwood (Lyonothamnus) about 8 feet up.
2nd. in live oak, about 12 feet up.
3rd. " " " " " " "
4th " " " " 6 " " (A and T from it)
No horse manure, feathers or snake skin, but lining of dried grasses, pine needles and burlap.
3 eggs--one disappeared. No later nest found.

P.27, Par.2. "Greasy black" young. My notes at time refer to their looking "wet".

Par.3. Doubt that this noise intended to frighten intruder because they make it when parents arrive~~d~~ at nest. Also x

Par.4. Common knowledge that they can be run down.

P.28, Par 1. Also use wings to bank in making quick turn. Have seen no "vibrations". Sometimes a few quick upward jerks but usually very slow raising and lowering. A sidewise slow wag on special occasions.

Par.3 Agree on not bathing. Dusting almost a mania. Begins even before young are able to take care of themselves

P.23, Par. 3 continued. Their plumage is kept saturated with dust at all times. It floats off from them in impalpable cloud. Will "dust" on clean concrete sidewalk and on top of my head! A strenuous operation.

Par. 4 Cannot confirm rare drinking habit. Mine drink certainly at least once a day, often several times and frequently drink from glass of water held in my hand. Dip bills in covering the nostrils, often wetting the feathers about base of bill. If very thirsty drink until water "goes down wrong way" and have to "cough".

Par.5 Extraordinarily quick in action. Rhody, three times picked flying sparrow out of air as it passed him (then released it) without my being able to detect motion of head with certainty.

This quickness perhaps explains several observations where victim apparently deliberately jumped into R's mouth without his making any movement to catch it.

Par. 6 Not at all good. Bird much more versatile than this. Perhaps a dozen different calls, "songs" and utterances recorded in my notes.

[illegible], Par 1. A splendid pet, gentle and confiding with a certain amount of cheek.

Par.2 About the only fruit my captives will eat is the berry of various pyracanthas and hawthorns, and then in very small quantity.

P.70.et seq. My birds eat butterflies, moths, beetles, salamanders (newts?), lizards (Blue bellied and alligator), bees, yellow-jackets , centipedes, snakes up to 15 inches in length, small slugs sparingly, snails sparingly, various beetles, mice, young rats, hamburger steak, angle-worms (rarely, as they do not care much for them), birds up to and including English sparrow size when offered them, swallowed whole, feathers and all, but sometimes feathers are removed; Rhody and the youngsters have always refused to eat quail eggs offered them; thousand legged worms (sometimes refused); crickets (Jerusalem and black); grasshoppers, cicadas, caterpillars, both hairy and smooth (The young birds rub off on the ground every vestige of hair on hairy ones without mutilating the creatures at all, before swallowing. Rhody not quite so thorough); flies, sow-and pill-bugs; occasional buds of milk-weed; wire worms, cut-worms, spiders, meal worms,an occasional ant, miscellaneous grubs. Also miscellaneous flying and crawling creatures not identified.

P.71, Par.1 No attempt is made to dismember any of their prey, everything being swallowed whole, though, as noted, sometimes feathers are removed from birds partially. In general it appears that the bird will not attack a living creature which it does not at least *think* it can swallow in its entirety, though two mistakes of judgement in this respect have been noted. One when Rhody killed a young rat that was too large, and the other when Archie killed a sparrow released in the cage, which he was unable to handle.

Repeated examination of droppings (not made with scientific rigor, however) have failed to show a single bone from the several hundred mice eaten by Archie and Terry, nor any feathers as a result of Rhody's eating sparrows given him. Mouse hair does appear in A and T's excrement and pellets are sometimes disgorged by them, although but 8 have been found, consisting apparently entirely of mouse hair, in their cage in about 8 months. It would appear that such pellets represent an accumulation of a very considerable period of time of such hair as failed to pass through the digestive tract.

P.32, last par. In completely denuding hairy caterpillars, leaving them smooth worms, is this the habit of the cuckoo?

P. 36, Lizards. Lizards appear to be Rhody's favorite food. He not only stalks them aware of their presence, but deliberately hunts for them in places where experience has taught him that they are likely to be found, and, moreover, when shown one, in hand, exhibits more lively interest than in any other kind of offering. Unless very hungry, he does not kill them at once, but places them on the ground, pretends not to see them, walks around them and waits for them to bolt. He plays with them. Curiously, the blue-bellied lizard, even when uninjured, makes no attempt to escape while in the bird's bill, nor for that matter, does it when placed on the ground for an indefinite length of time. The alligator lizards show fight. Both are invariably swallowed head first, as are all other creatures, whole.

P. 37, Snakes. No limit of size eaten has been determined here. Rhody swallows 14 and 15 inch gopher snakes but it takes a few minutes and then he has a "stiff neck" for several minutes after. Yellow bellied racer and gopher snakes 2 to 3 feet long, when found by him are variously treated. That is, they may be merely glanced at and ignored, watched curiously, followed through the grass and bushes at a discreet distance or actively chased. In the latter case, sometimes until it escapes through the wire fence whereupon interest is lost. In no observed case has he actively attacked a snake longer than 15 (measured) inches in length. Such snakes are also played with, like lizards. Some of the small gopher snakes fight and strike at him furiously. This gives him no concern. When they strike at him he nonchalantly plucks them out of the air by the head with unfailing precision and whips them on the ground, letting them go for another chance. When tired of this, he gets down to business, whirls them over his head and slaps them unmercifully upon the ground until they are dead.

I do not think any snake, except by chance, could actually strike him. A small rattlesnake undoubtelly would be treated as any small snake. A large one would probably not be attacked at all.

(Curiously, Rhody catches small snakes only by the head, whereas Brownie, the California thrasher,

a much smaller bird, takes hold of any sized snake, and then it is by the tail. When the snake is definitely in retreat he swarms all over it, pecking it. Rhody never pecks them).

P.77, Birds. Any of these three roadrunners will eat any bird offered it, provided the bird is not too large and is either living or freshly killed. I have seen Rhody eat but one bird that he found dead, himself, a bush tit. He, at one time, occasionally menaced Brownie, the thrasher; sometimes chased the quail a few feet, and once also a Brown Towhee about 25 feet. In none of these cases did he drive his attack home or seem in earnest. Twice he was seen, within a space of 10 minutes. to stalk an Anna hummingbird, like a cat. It looked like a real threat, but nothing happened.

The quail rear two to three broods each year, here, often nesting against the walls of the house. I have never seen Rhody attack any of the young and the adults are not afraid of him; sometimes he is seen out in the field in their company.

On the other hand, last year, when I had Archie and Terry, then mere squabs, in a small bird cage at my feet a male quail, despite my presence, made fierce efforts to get at them through the wires.

The Plain Titmouse, the Spotted Towhee, the Wrentit and the Bushtit (to a lesser extent) on the other hand suspect Rhody and I often locate him by their outcries. He, however, pays no attention to their following about and scolding him.

P.78, Eggs. As stated Rhody has been tempted with quail eggs and not succumbed. I have also left them where he could find them without being embarrassed by my presence (by the side of his meat dish) and he has never disturbed them.

P.47, et seq. I would classify my roadrunners, after months of observation, as moderate eaters. Certainly they are not gluttons. They will go for hours every day without eating although food is always available. When they do eat, the quantity taken is not large.

1936

January 1st.

Brownie is getting more vocal and Nova is now seen with him oftener.

January 2nd.

Heavy rain during the day. The young road-runners no longer regarded it as a novelty and kept out of it. They are learning.

They still are afraid of children, even when the children are quiet, but near the cage. Thus, today, they became panic stricken at the sight of Dr Reynolds' little boy, T scraping the top of his bill again.

January 3rd.

Brownie and Nova much interested in each other and B singing often during the day full song. Nova frequently added her voice and was much less shy than usual. She even remained in full sight in the presence of Mr. Cain and 5 or 6 boy scouts. B was unusually bold in the presence of such numbers, coming without hesitation to me for worms while I was standing with the group.

The young road-runners were frozen at the mere sight of the visitors 20 yards from the cage, T in his sleeping place and A in the small house. I took hold of Archie's bill; he was as stiff as if carved out of a solid block of wood. As a test to see if he would remain frozen if the object of his fear approached close enough to seize him (having the alleged charming of birds by snakes in mind) I had the visitors approach en masse. (One of them wore a maroon sweater). Archie tolerated them, or at least did not bolt when they stood about 6 feet away, but when one of them moved a little nearer it was too much for him and he flew out of the house, thus showing that he was by no means in a helpless state of trance, but was, on the contrary, well aware of events. Terry remained quietly in his bunk, but he could not see the boys from there (nor they him).

Later in the morning another boy scout (W. [illegible].) came to see if he could get a snap shot of Rhody. After looking all over the plac for the creature he was found placidly sitting in an acacia near the cage: right where the search began. We had decided that he was off in the fields somewhere and would not have found him had he not moved in the branches, thus enabling us to locate him by sound- a rare bit of carelessness on his part--or perhaps he was not afraid, since, on being shown a live mouse he condescended to come down and allow himself to be "mugged" by a stranger.

January 4th. to 6th., incl. (Notes written 6th.).

B and Nova.

During this period Brownie and Nova were frequently in the same vicinity, usually "talking" to each other, B continuing the conversation even when coming to me for worms.

On the 4th. I had an opportunity of observing simultaneously the reactions of Archie, Terry and Rhody to the passage of a hawk overhead, perhaps 50 feet up. A and T froze for perhaps a half a minute, then thawed at once. Rhody, without any particular haste, moved into a clump of chrysanthemum and remained quiet except for moving his head about slowly. He seemed to have no particular

fear and readily accepted proffered meat, coming out of the bushes boldly.

Rhody and children.

On the 5th. Rhody was hanging around interestedly while I was planting seeds. He climbed up into the dormitory tree, then moved over to a low acacia next to it without haste. I then heard childrens' voices. A glance at the cage showed A and T concealing themselves in the acacia branch in the cage annex. Four little children and a frolicsome Irish setter were coming up the driveway: part of the group that frightens the young road-runners at a distance. I had them come to me under Rhody's tree in order to observe his reactions at close range (I.e. : to children at close range). He was only about 6 feet over our heads absolutely immoveable except that he winked from time to time. He blended into the foliage and twiggery so perfectly that even one of the children commented upon it. As long as we stayed (several minutes) he remained fixed in pose even when we moved about. After the children had gone, he reappeared to observe my operations.

The young ~~thrashers~~, instead of running about wildly (I had kept the children away from the cage) remained quietly on their perches, out of sight.

Terry shows nesting instinct ?

At 10 A.M. on the sixth I was watching Terry from outside the cage. He picked up a forked twig and began to carry it about, saying ook, ook deep in his throat. This is the same "embarrassed" sound that they make sometimes when trying to squeeze by me in a tight place. It had not been heard before in combination with twig-carrying. T appeared to be looking for a place to put the twig and finally carried it up to his bunk in the annex whence it was seen to fall. This is new and suggests a possible early manifestation of the nesting instinct.

The RR "ook".

This ook (the oo as in book, not as in tool) ordinarily seems to be either a sign of embarrassment or perplexity or an approach signal, perhaps either. It is used as above noted and Rhody, when slightly nervous, uses it while trying to screw up his courage to reach just a little farther for the food held out for him. Both youngsters almost always use it when announcing their intention of jumping up to my shoulder. It can be heard only a short distance away, perhaps 6 feet as a maximum. I usually hear it at 3 feet or less.

The pleading ma.

The long drawn out, quavering ma pathetic or pleading in quality, uttered with head lowered to the level of the feet (sometimes lower when the bird is on a perch) with mouth wide open is used by all three birds, many instances being recorded herein, and so far noted only as addressed to human beings.

Terry uses it most. It now seems to be a call for food, companionship or some kind of attention. When Rhody wanted food for the youngsters in the nest he was particularly urgent about it, less so when food is wanted for himself. The young birds often start it when I am still too distant to hear it and usually desist when I merely stand beside them, as if satisfied. Terry, however, seems within the past week or so, to have relapsed into a sort of second childhood and does not hesitate to use it as a call for food, even when there is plenty all about him. His attitude seems to be that he is too comfortable where he is and would I be so kind as to get that piece of meat and hand it to him? This done gobbles it and relaxes into indifference to all worldly matters.

He does not put himself out in the least to get the food himself on these occasions: I am supposed to do all of the work except the actual swallowing. If he drops it, as he frequently does in an endeavor to get it properly oriented so that it will go down easily, I am the one that has to recover it, for he usually will make no effort whatever to pick it up.

This behavior, of course, is not really " a relapse into a sort of second childhood", but a reaction based upon his repeated experience that it brings about a certain desired result. (Or something like that). But what is to be said about those times when he cries in this way when he does not want food? As one of many specific examples: Today I gave him a live mouse where he sat quietly on the platform of the "house" in the outer cage. I went away after he had disposed of it, returning in about a half hour . He greeted me with this cry, but, when I offered him food, ignored it and stepped to my shoulder. (The platform is at about shoulder height). There he disposed himself for an indefinite stay, seeming to be happy in having me stroke his plumage while he looked off over the surrounding landscape. On this occasion the cry was, I suppose, one of recognition of a friend and, perhaps also an appeal for attention.

Physical differences
between A and T.

As judged by eye alone, there is less difference in size between these two birds than formerly. Visitors frequently pick Terry as the larger of the two, but they do not make allowance for the disposition at the moment of the feathers of the two birds, nor for that curious illusion that makes the more distant bird look the larger. There is now, I think, little difference between them, though Archie is the larger. There is one respect in which there is no doubt, and that is: his two middle rectrices are certainly wider. Further, although having no bearing upon size, he has more black inside of his mouth.

He is also stronger, as witnessed by his ability to kill a mouse with greater despatch and in jumping up to a certain perch, uses his wings less. (Rhody can kill a mouse quicker than Archie).

How high can
RRs jump?

Defining a jump as limited to height accomplished by use of the legs only, both Archie and Terry are able to make a high-jump— that is, a standing high-jump of 3 feet 1¼ inches (94.5 cm.). without using the wings even as sustaining surface. This is the height of a certain perch above a certain rock in the cage. In accomplishing this jump they also cover 1 foot 6 inches horizontally at the same time. This height is fixed and does not necessarily represent the maximum possible by either bird. Archie usually does not use his wings in making it. but Terry frequently gives one small flap. To equal this performance. a man, using height of man and bird as a basis, should be able to make a standing high-jump over an ordinary two story house with ease!

January 7th. to 14th., incl.

A rainy period during which the rainfall for the season passed normal, notwithstanding the large early season deficiency.

All birds under observation present and accounted for, but not very active.

January 15th.

About 11 A.M. Rhody was heard to open the season with his spring song: Coo, coo. .... .etc.; this is the first one heard from him for several months, and doubtless indicates renewed interest

in matrimonial prospects. When I looked him up, he greeted me with a mild rattle-boo: also the first heard from him for a long time. It will be interesting to note whether the mirror, which he has neglected for the past few months, will again prove attractive, thus, perhaps affording some clue as to whether his cavortings before it are in some way linked with aroused reproductive impulses

He still uses the pine as a night roost, going to it about 3:15 P.M., not apparently influenced by weather conditions.

January 16th. to 20th., incl.

's spring song ntinues.

During this period Rhody continued his spring song, wandering from tree to roof, closely following last year's procedure, never going far from this place and sleeping in the Scamells' pine every night.

By looking up last year's notes I find that his first song of the season was on January 31st., so that he is 16 days earlier this year.

renewed interest in A and T.

I can not see that he shows any greater interest in his offspring than usual, and they, in turn, while they plainly listen to him when he calls nearby, show no excitement although Terry once seemed to respond to one of his first calls by uttering one of his rare Hrooh, hro-o-ohs and then relapsing into indifference.

and T of same weight?

It begins to look as if Archie and Terry were now more nearly of the same size than formerly, making due allowance for Archie's wider and heavier tail. Terry feels fatter about the breast-bone.

rchie's red spot brighter.

Archie's "red" on his skin patch is now undoubtedly considerably more colorful than T's, suggesting that if there is a difference in sex, Archie is "still" the male.

Weather.

During this period the weather has been bright and warm. Rhody's anticipation of spring has been paralleled by the behavior of the trees and shrubs, many almond trees and flowering members of the Prunus family having been in bloom for several weeks.

On the 19th. Dr. and Mrs. Grinnell came with Major Allan Brooks, arriving after Rhody's bed-time, although I was able to keep him interested for nearly three quarters of an hour after his usual usual time of departure for his roost. However, he got out of control just a few minutes before the arrival of the visitors, although we followed him up and had a fair look at him despite his fear of the unusual number of persons present.

January 21st. to 24th., incl.

No change in the weather.

Rhody wandering somewhat further in his search for a partner.

Archie and Terry were weighed with the household scales; this time Archie was the more accommodating and decided that the instrument was a good place to lie on and have a good rest. It recorded him as weighing 12 or 13 ounces, depending upon what portion of the pan he occupied. (The scales are very insensitive). Terry's weight (on one trial) was recorded at 12 ounces.

Using the conversion factor of p.1008, this would make the indications in grams as follows:

Archie	348 to 377
Terry	348

348 is the weight for Archie on July .4th., A being 261. No great reliance can be placed in these figures, but it is safe to say that Terry has been catching up to his nest-mate, and eye-estimates approximate the truth.

More about the Ma cry and accompanying behavior.

Archie, perhaps from the example of Terry, is now becoming addicted to this behavior. More in detail than on p.1103:

If on a shelf or on the ground, the neck is stretched out fully parallel to the surface upon which the bird is resting, or even laid flat upon it, mouth wide open, head vibrating from side to side. If there are small objects such as twigs, leaves or stones within convenient reach, the bird will often pick them up and worry them. At times, also, it will run to a weed and begin to pull leaves off of it.

If on a perch it will either stretch out its neck as noted above, or else extend it vertically downward far below its feet, ma-ing with wide open mouth. (It is not perhaps really a ma, but that designation will serve to identify it).

About noon (24th.) Terry in a sand-box in the S.E. corner about 4 feet above the ground, started ma-ing when he saw me coming. Archie, on the ground, immediately ran and picked up a stone, about walnut size, flew up and joined T in the same demonstration, dropping the stone. I had been in the cage with them a few minutes earlier giving them meal-worms.

At 3 P.M. I left the cage where A and T, alternately, had been lying on my shoulder and lap. As I passed along the front of the cage, outside, both began ma-ing again. They certainly could not have been hungry, as there was plenty of food in the cage and they seemed satisfied with what I had handed them while in it. But I went in at once to see what it was all about. They would not take meat, nor were they particularly keen about meal-worms. Terry, however, drank thirstily from a glass of water held out to him, although there is always plenty in the cage.

At 3:16 P.M. I returned with 3 newts (One the thick-heavy kind and two the worm-like very wriggly kind---I suppose they are all newts). Both birds began their ma on seeing me, but they did not want the newts. (Archie likes them, but Terry will never take the large ones and is more or less indifferent to the small ones). They did take a meal-worm or two, but were soon satisfied. Hence it would appear that the occasion for the present greeting was not hunger.

January 25th. and 26th.

During this period Rhody, although present as usual, was using his spring song less; in fact it was not heard at all on the 26th. On one occasion, when he was standing about 3 feet in front of me where I was crouched talking to him and trying to induce him to let me weigh him, he startled me by uttering a tremendous "rattle-bo" right in my face.

January 27th.

January 27th.

Another night scare. As I approached the cage in the morning the young roadrunners were very subdued and did not greet me, though waiting in the usual place on the perch at the entrance. The foreheads of both were cut and bleeding and their upper mandibles abraded through to the quick. Feathers were all about the cage and up on the wires. About 100 were picked up (over 90 were actually counted). Feathers of all kinds were present: tail and wing feathers; crest, body, head, neck, breast and even from the false wings. I enclosed each of the birds in turn in both hands without their trying to avoid the contact. Both were trembling. Tremors would sweep over them in consecutive waves. By placing my ear against their sides lightly the sound~~s~~ caused by the muscular action could be plainly heard, coinciding in time phase with the trembling as felt by the hands.

They were pathetically gentle and compliant, but suspicious of all outside events, watching and listening keenly, and showing no tendency to avoid each other. Throughout the day they were extremely nervous, responding to the alarm calls of outside birds and ready to freeze at any moment.

They must have had a very bad fright in the night or the early morning. No cat was caught in the trap. The bait was not taken. Probably a hawk or an owl was to blame.

When bed-time came they would not go to their regular roosts, although Archie would repeatedly follow his regular route to his couch part way and retreat. Terry would not even go near his, nor would he voluntarily enter the covered part of the cage. He reverted to the same tactics used when he and Archie had a misunderstanding as to resting places, that is: he sought out all sorts of uncomfortable and exposed corners and, for the first time in many weeks, sought to put up for the night on my shoulder with tail against my cheek.

As the light began to fail they rapidly became more helpless in their wanderings, peering nearsightedly at objects and hesitating to jump up to perches with which they are perfectly familiar There is a certain long, narrow perch along which both birds are wont to run expertly in the day-time. Placed on this, Terry spread his wings and tail as if in fear of falling off (which he nearly did) then crouched low and started walking along it with utmost care, haltingly like a decrepit person walking a plank over an abyss. Yet it was not too dark for me to see well enough to perform any accustomed act with ease.

It seemed clear that the birds had been frightened while in their beds and fear of those locations remained with them. That is what I wanted to find out as possibly throwing some light upon their sudden and complete abandonment of their former roosts as covered by earlier notes.

Curiously enough when it became so dark that they could not (I suppose) see well enough to do any further investigation of other locations, each bird made its one and only effort to occupy its regular resting place, blunderingly but successfully. It was now 5:45 P.M.--long after their regular time. (Sunset 5:26, cloudy).

8:15 P.M. They are comfortably at rest in their usual places. A large cloth is over the entire top of the cage to protect them from marauders from above. By Wednesday night I hope to have in place a system of 10 oz., khaki-colored duck covers in operable from the ground, covering the roof, removable in the day time. This will extend to 3 feet below the eaves, down

the sides and. I hope, will prevent disturbing the sleepers by aerial, nocturnal prowlers .

8:25 P.M. (Cloudy, mild, threating rain, Temp. 57deg.).

January 28th.

Bright and fair ; there was no rain.

The young road-runners remained somewhat disturbed during the day and, as bed-time approached, again wandered about restlessly. Terry again sought my shoulder as a night roost. It was not until 5:50 P.M. that they essayed to occupy their regular roosts.

January 29th.

The roof covers were installed today. Neither A nor T was at all disturbed by the men working about the cage. In fact they were curious about it all, being especially interested in sawing operations. At bed-time they again put off going to their regular places until it became so dark that I helped them. Archie managed to get within one short jump of his bunk, but did not dare to make the last leap in the dark, so I offered myself as a ladder. When he reached my shoulder, he, for the first time, decided to sleep there, and repeated Terry's tactics exactly. I finally boosted him up to his bed and had to push him into his usual spot in it, since he merely clung to the edge.

Terry continued his efforts to roost with me and was finally put to bed properly.

I am more than ever impressed by their extraordinary helplessness in moderate darkness.

Rhody for the first time this year, renewed his last year's habit in courting time, of carrying food about for his invisible intended bride. When he came to the cage at noon, he picked up a piece of meat, faced the two youngsters with it in his bill, bowed slightly and began to wag his tail back and forth slowly in a horizontal plane. The young ones merely stared at him, without comment. He then wandered off repeating the gesture at times, still carrying the meat, although there was nobody to whom to offer it. All this brought no results, so he ate it.

January 30th.

When R came to the cage this morning he carried with him a billful of soap-root fibre, dropping it to pick up the meat. (There were two other men standing near with me). He trotted off with the meat and proceeded to offer it to invisible (and non-existent) prospective mates with sidewise tail-waggings, then, as before ate it himself. He made several returns for more meat, but each time gobbled it without preliminaries.

He continues to "sing" at irregular intervals.

Archie and Terry, the latter being the more advanced in this respect, are beginning to hroo more frequently. Archie twice today-- a record for him--once while lying on my knee enjoying the sunshine. Terry, three or four times, the first being a reply to me when I hrooed softly to him within six inches of his face. This is another "first", as hitherto he has only ma-ed on similar occasions or opened his bill wide and shaken his head without uttering any sound.

Rhody, during the past few days, has begun to defer his retirement for the night, roughly corresponding to the increased length of the day.

Brownie is finding difficulty in keeping Nova here, and as a result, has to make extended excursions down into the canyon on the west and the ridge to the east.

Other thrashers are being heard in the distance occasionally. Brownie's full song is still fragmentary and more in the nature of a succession of calls with little variety. When Nova is near, though out of sight, he maintains contact with a running series of gurgles and other inarticulate sounds.

5:50 P.M. Well, I let myself in for it by putting on the roof covers, as I have just discovered.

Both Archie and Terry went to their regular sleeping places before dark, having perhaps overcome the residual fear of them from the last night-terror. However, when I rolled down the covers, out they popped and they were unable (or unwilling, or afraid) to make the last jump that would put them safely in their bunks, owing to the resulting darkness. Consequently I had to put them to bed like little children. The magpies in the adjoining cage are not so night-blind.

January 31st.

This business of covering the cage requires finesse. If covered before the birds have gone to rest, they can not find their beds; if covered too soon after they have gone to bed, out they come, as I have once more discovered tonight. In either case I am compelled to act as night-roost for the pair of them, or else put them to bed. By partially removing the cover immediately over Archie, I found that he got enough light to enable him to handle the situation properly; but this did not work with Terry and I had to pick him up bodily and stow him away on his shelf. The next step was to lower the curtains very slowly, and this worked.

Terry is so night-blind that he would not risk stepping from my hands 3 inches horizontally to his shelf. I had to put his feet on it. What easy victims these birds would be for a large owl if roosting outside in a tree!

Terry's bill.
(Also A's).

The decurved tip on T's bill has been getting very long--longer, in fact, than Rhody's. I wondered what Nature would do about it. Today it was noticed that, since some time yesterday, it has been shortened so that it barely projects below the lower mandible and is now like Archie's.

Based upon but one observation, it would appear that Terry does not depend upon sight solely to recognise the approach of a friend. When I went to the cage this morning he was still abed, and although I could not see him, and am reasonably certain that he could not see me because of the curtains, he began to *ma* when I was still about 30 feet away. When I went inside he hung his head down over the edge of the shelf and continued to make this sound but appeared to want nothing unless it was companionship.

Example of acuteness
of hearing?

Very often one of the young road-runners will suddenly stare fixedly at the ground for a few moments, then run as much as three or four feet and begin digging with his bill. Usually at a depth of an inch or two he finds something, picks it out and

swallows it. It is seldom that I can discover what it is. It is never an angle worm. Possibly it may sometimes be only a pebble. But there are times when it is seen to be a minute insect. From the fact that it is found beneath the surface a considerable distance it would seem that it must be the sense of hearing that enables the bird to detect its presence: yet, considering the distance of the bird from the object it hardly seems credible.

The case of the Robin listening for worms in the lawn and getting them, at which so many people marvel, is really not extraordinary at all. Any person with normal hearing, under proper conditions, if told what to listen for and directed to the source of the sound, can easily hear angle worms working, as I have proved repeatedly to skeptics. On the fairway of a golf course after a heavy rain I have often heard a rushing sound coming from all directions as the worms discharged their waste at the surface of the earth --the "worm-casts" execrated by golfers on the putting greens--and I have had a whole foursome (when there was nobody too close behind) stop, look and listen until convinced.

Brownie and Nova have been much in the kangaroo thorn (Acacia armata) where nest 10 was started on Jan.31 last year, and where he and Greenie had one of their ill-fated experiences.

February 1st.

A rainy day. Rain began about noon yesterday. The bird world very quiet and not much in evidence.

When Rhody appeared about 9 A.M., after a night of hard rain, he did not look very wet, and when he preened at my feet it was seen that he was perfectly dry underneath his thick thatch of feathers. He did not want the freshly killed mouse offered him. A live one he killed but abandoned. He refused meat also, but when I showed him meal-worms, became interested at once, catching them expertly.

All three road-runners will eat these creatures even, apparently, when not hungry.

I kept away from the road-runner cage purposely until it was dark. A was in his regular place, but T was in an exposed position, so I carried him to his shelf. This time it was too dark for me without a flash light.

I tested T for eye shine with negative results. As these notes show, eye shine has been observed in these birds in the day time, but I have also seen it rarely under favorable conditions in human beings. In the generally accepted sense, I doubt if these birds can be considered as having eye shine.

February 2nd.

About 8:30 A.M. Brownie was singing loudly and continuously over at Robinsons'. I stood about 250 yards away and could see him silhouetted against the sky. (Sunny morning). Contrary to the usual order of events, Nova was singing her odd song in plain sight about 50 feet from me at the entrance to this place, in a climbing rose on the fence. It "ought" to be the reverse. I called B repeatedly and Nova moved to less than 20 feet from me--another unusual happening.-- and sat answering B from a perfectly

open position where she could keep an eye on me. I called B again--the dark object against the sky disappeared and in a few moments B came up behind me.

Nest 12?

About 9:30 I decided to see if there was anything doing in the kangaroo thorn. I stood on the sidewalk below it. Thrasher conversation could be heard behind its dense foliage. Soon I located Brownie messing about at one particular spot engaged in what appeared to be nest construction.

Curious parallel to last year in R and B's behavior.

At 10:35 I revisited the acacia. B was sitting above the suspected nest site, Rhody was singing someplace nearby. B came to me at once for more worms, then messed about aimlessly with twigs. I went to find Rhody, who was located on the other side of the fence in an oak about 30 feet away. (Curious how this parallels behavior of Jan 31(?) last year. B came back through the fence to see what was afoot and observed Rhody warily, then ran off. R kept on singing, but back toward the nest site. This is only the second time Rhody has been seen in that particular tree in nearly two years, the first time being when he unexpectedy booed at me from it in the beginning of our acquaintance, when I was not aware of his presence there.

Mirror not exciting to R.

Earlier Rhody had been at the cage, sitting on a bench against the wire watching the youngsters, who were mildly interested in him and "talking". When tired of this, R looked at the mirror reflectively but was not stirred to action by his reflection. Next he made a feint at one of the magpies that came to look at him and then wandered off to call. Clearly he derived no permanent spiritual satisfaction from his visit.

Thrashers nest at "wrong" time.

At 11 rain began to fall again. It is strange that the thrashers should choose what is ordinarily the most inclement season of the year in which to commence house-keeping activities.

Terry, as usual, greeted my reappearance at the cage by ma-ing pitifully. I went in and handed him the piece of meat that he had practically been sitting upon for the last hour or so. This he accepted gratefully. He still prefers to be fed rather than help himself, in marked contrast to A. (Except as regards meal-worms).

After this Terry fluffed himself out and remarked, apropos of nothing, in soft, sweet tones, audible perhaps 6 feet:

˘

Oon Ooo,

the Oon pitched at about the C above middle C and the Ooo at about the G above middle C. In the next ten minutes he did this twice again. When I rose to leave the cage he ma-ed. In the last few days he has tended to adopt this procedure on my departure as well as on my arrival. In some respects he acts more like a baby bird than he did months ago.

During the day there were alternate periods of sun-shine and shower, the former predominating and finally prevailing entirely.

At bed-time the young road-runners sought their accustomed roosts. I waited until it was dark and then lowered the covers without disturbing them.

February 3rd.

At 9:30 A.M. Brownie was found working at his new nest. It is where located yesterday.

Rhody was singing about 30 feet away, paying no attention to B's operations. He looked with interest at a freshly killed mouse, but did not want it.

Archie and Terry each had a mouse, although they had eaten some meat an hour or so earlier. About 10:30 Terry cried when I approached the cage. It seemed a good opportunity to prove (since he was presumably well fed for the time being) that here was a clear case of the call being one of recognition and not a request for food. Consequently I entered the cage and offered him meat, which he promptly ate!

February 4 th to 6th, incl.

During this period Brownie continued to work in leisurely fashion at his nest. Nova is there with him at times, though I have not seen her actually working.

B is already "nest conscious", in that when he is away from it he constantly looks in that direction and runs toward it when it is approached by jays or there are other happenings in the vicinity to make him uneasy.

Occasionally when I approach it and call he will leave it and fly directly to my hand.

His vocal activities now are largely confined to efforts to summon Nova when she is absent, which is often. History, as it concerns her, is repeating itself.

His whistling-for-the-dog call followed by the kissing sound is inexpressibly human. It is an exact duplicate of a human performance, is often used and, moreover, it works, seldom failing to bring Nova to him if she is anywhere near. I suppose this is really primarily a case of mimicry, but in the end it has with little doubt developed into a conscious, intentional call to his mate. It seems clear that he has, from experience, learned that this particular call brings about the result he is seeking, and this, to my mind, implies a considerable degree of intelligence. In any case, it is remarkable that a bird should use precisely the same "tune" as a man to call a fellow creature from a distance.

Rhody continues to call unsuccessfully for a mate, mostly during the forenoons. In this he excessively modern in method, patterning himself upon the young human male of today who honks his horn out in the street knowing that the feminine object of his attentions will rush out of the house precipitately and climb obediently into his motor car. Thus Rhody seems to expect that there is no need for him to travel far from here--she'll come.

When in singing mood, he is not at all bashful. He will sing "right in my face", say 6 feet away on the ground in front of me. At such times I sometimes catch that same peculiar overtone mentioned herein once before, as if some exceedingly light, thin, metallic part of his vocal apparatus were not screwed down quite tight enough and vibrated rapidly. (Somewhat like the effect given by a piece of paper laid upon the strings of a piano). It seems to be an accident when it happens, and usually occurs on only one or two of his coos in a series. Usually the first one only, and then not often.

Archie, Terry and the mirror. Archie and Terry were given the mirror to play with today. Terry was the more interested, touching his image with his bill and returning frequently for another view; but there was no great excitement and no displaying. Archie regarded himself in a bored sort of way--was a little surprised when the "other bird" moved when he did, but went away indifferently and did not appear to have any farther interest in it. (Rhody is still indifferent).

February 7th to 13th, incl.

A period of frequent, heavy rains, during which most birds sought cover.

Brownie continued to work at his new nest, but in casual fashion. On the morning of the 13th. he and Nova inspected the dormitory tree and Brownie investigated his old nesting place under the roof behind the wind screen as if considering (as was the case last year) abandoning the new nest in the kangaroo thorn.

Rhody continued his visits to the cage, but, probably on account of the weather, sang less. On the 11th he was not in his roost at 5 P.M., but in the morning following he was there at 9:45 A.M.

The morning of the 12th, Archie, although he has carried a leg-band for 7 months or more, for the first time was seen to be aware of its presence. Throughout the day he made efforts to pull it off, at times pulling so vigorously as to upset his equilibrium by pulling his foot out from under himself. (It has often been noticed that road-runners do not seem to be able to stand on one leg-- here). I "helped" him by holding his foot for him so that he would not upset. He accepted this aid readily. The next morning he was at it again. He permitted me to take hold of his foot, raise it and cut off the band without attempting to escape or showing any uneasiness.

February 14th.

Again some sort of a disturbance in the road-runner cage during the night. This morning at 7:30 both birds were seen to have injured their bills and foreheads again and there were 20 or 30+ soft feathers scattered about the cage. The protective screens were in place and there were no signs of a prowler on the roof or elsewhere. Can it be that the youngsters are quarreling?

9:40 A.M. Examination of the youngsters and the cage more in detail shows:

More than 30 fresh feathers were lost.
They were all "soft" feathers from the body and one small tuft from the neck.
+69 by actual count!
There were no crown or crest feathers.
There were no feathers at all on the wire screen of the cage.
Archie has a wound on the back of his head, a place where it seems impossible for an injury to have occurred by mere contact with anything about the cage.
Nothing was caught in the cat trap. (A large brown rat with white feet was caught in it night before last).
There is no opening into that portion of the cage in which the birds sleep large enough to allow anything to enter larger than a small mouse.
Neither bird showed any nervousness at 7:30. (There

was no remnant of fear).

Julio heard a cat yowling around the premises at a time estimated at 5 A.M.

No cat tracks could be found in the soft, damp earth about the cage or on the canvas covers on the roof. (I had already looked for them before learning of the cat).

A and T were no more wary of each other than normal. (There is usually a slight tendency for each to avoid too close approach of the other, though at times this precaution is waived).

Last night Terry had been reluctant to go to his regular sleeping place, persisting in an attempt to spend the night on my shoulder when I entered the cage on finding that he would not go to bed properly. (We compromised by my taking him bodily and putting him to bed).

Speculation leads nowhere definitely. It suggests that there was perhaps a quarrel, also:

That A and T are of opposite sex and that their instinct are being aroused.

That they are of the same sex and are asserting their claims to dominance.

That road-runners are solitary in their habits (Except in the breeding season) and can not get along together when confined in the same cage.

That Terry covets the hanging nest as a couch. (He will look at it but not go into it. There was a dispute over it some months ago; first one bird and then the other having possession).

No serious quarrel has ever been witnessed between these birds, i.e.: One in which there has been an interchange of blows. On the rare occasions when one loses patience with the other there is one blow and the recipient retreats at once and stays away. In most cases, though not in all, the strategy consists in the attacker seizing the other suddenly by the base of the bill (the tender place). The attacked squawks and flees, and that is the end of it.

7:30 P.M. At bed-time neither bird would go to his regular sleeping place, but wandered about trying one place after another, rejecting them all, except that Terry seemed willing to sleep on my shoulder as usual. Archie would go and sit on one of the principal supports of the hanging nest, but would no enter it. (It should be recorded here that I had shifted this nest during the day time about 18 inches horizontally without, as I thought, making any conspicuous alteration of its relation to surrounding objects).

A few minutes ago I found A sitting on the same support and T on a low shelf. I put A in his nest and T in a new one like it. Neither bird would stay in but would remain perched on the edge. (This new nest was located similarly to the hanging nest, an and was decided upon on the assumption that the present disturbance resulted from Terry's attempt to recapture the hanging nest from Archie--a pure guess--and that if T were provided with one like it this source of friction might be removed).

Terry's "regular" shelf in the annex was raised about 4 inches to give him an outlook to the west; lack of this outlook heretofore has been the only drawback I could see to that particular location. However, Terry would not even approach it voluntarily

at bed-time; but I got him onto it by strategy several times by taking advantage of his assumption that he was going to sleep on my shoulder all night and walking with him to his bunk and putting him into it before he could realize what was happening. Each time he stayed a few seconds then made for the perch fastened to the inside of the entrance door--the most exposed and hazardous location in the cage.

10:30 P.M. A and T are still sitting on the edges of their respective bunks, where they were at 7:30.

February 15th.

Worked all day on a 9' by 12' extension to the cage to give more space for photography without objectionable shadows of posts and rafters. This gave me a good opportunity to check up on Rhody's comings.

Rhody's visits to cage.

He came four times while I was there, staying from ten minutes to an hour each time and never going far away. He was perfectly at home, walking about on my construction work, taking food from hand and observing the youngsters. His song continues, but at irregular intervals.

A and T still averse to usual roosts.

At bed-time last night's experience was repeated. At 6 P.M. (Sunset: 5:48) A and T were still up, A sitting by his bed and T on the perch at the entrance. The latter welcomed the approach of what he considers his own special perquisite and immediately transferred to my shoulder, puffing out his feathers, placing his warm stern against my cheek and settling down for keeps. I put a hand under him and he transferred his feet to it. I walked with him to his new nest and put him in it successfully this time and he immediately settled in it comfortably.

Archie I left to a later occasion.

At 7:30 T was still in his new bed, A on the nest support. A stepped readily on to my hand and I put him in his bed also and he stuck.

It will be noted that, as on other disturbed occasions, these birds seem to have formed some unpleasant associations with their regular sleeping places and are reluctant to go to them. It is as if they had been attacked in them and remembered it. The question then seems to be: Is the attack from without or within? To this there is no definitely known answer.

Terry's adult characteristics.

Although Terry seems, in some respects, more of a baby than ever, he has recently shown some adult characteristics more definitely than Archie, heretofore the more advanced. Thus T hroos much oftener, carries twigs more and even takes them up to roosts, etc., rattle-boos more frequently and has developed the very Rhody-like slap of the wings over his back which A has not been seen to do at all.

10;15 P.M. Archie and Terry are still peacefully reposing in their beds. What next?

February 16th.

A's "black-eye".

Possibly due to the wound on the back of his head, Archie's skin patch back of his left eye shows, in the normally white portion, a decidedly green tinge. The other side is unchanged.

Terry demonstrates why tail support necessary.

About 10 A.M. I was watching Terry dozing on a perch. His eyes gradually closed and he lost his balance, catching himself just in time as he was about to fall off of the perch backwards. This incident suggests a reason why road-runners seem to prefer flat places on which to sleep and why, when none is available, they select a place where there is support for the tail.

B begins "thinking eriod" in nest.

On two visits to the thrasher nest this morning Brownie was found sitting in it quietly doing nothing. This seems to be the beginning of the "thinking period" in the nest observed on previous occasions.

Nest 12.

This nest is in the kangaroo-thorn in the "chaparral" patch on the south bank--the same shrub where nest 10 and nest 2 were built.

Bed-time behavior of A and T.

I do not understand this situation at all. Neither A nor T would go to his accustomed sleeping place. Archie was more at a loss than I have ever seen him before, he even tried Terry's trick of settling for the night on my shoulder. I wondered if there would be a dispute over this place, so waited to find out. Soon Terry came, saw Archie in possession, uttered a rapid succession of soft ooks, did not hesitate a moment, but crowded in between Archie and my neck. A promptly departed without there being any fuss about it, but later, T still being on my shoulder, tried the top of my head. At last, at 5:40, he saw the new bed made for Terry yesterday, apparently for the first time and decided to use it. At 6 P.M. when I left he seemed definitely settled there and Terry was still homeless.

Archie steals bunk intended for T.

At 7:30 A was still in Terry's new bed and T for the first time in months was in the old sleeping place shown in sketch on p. 1042; this selection having been made perhaps on account of its being easy to find in the dark.. I shifted him to Archie's hanging nest, since it is better protected and was at one time Terry's favorite place, and also as a sort of joke on Archie, with the further object of developing whether this new disposition of the youngsters would result in friction between them when it gets light enough for them to see what has happened.

Night docility.

When handled after night-fall both birds are extremely docile, do not shrink on being approached or touched and do not struggle when taken in hand.

February 17th. to 19th., incl.

Weather "unusual".

According to the evening papers (19th) we have had an "all time" record rain-fall during the past ten days--about 6 inches--with some rain every day. Temperature have been running about 60 max. and 50 min.

During this three day period there has been little change with the birds.

Brownie usually to be found somewhere near the nest, but working little. Somehow he manages to keep dry.

Rhody quite normal, singing occasionally, sometimes within reach of my hand, also keeping dry, still roosting in the pine.

The young roadrunners are still uncertain about their sleep-

rat?

ing quarters. Mr. J.W.Brock, without knowing that I had just caught a large rat outside the cage, suggested a rat as the possible cause of the night alarms, since the covering of the cage would minimize the probability of its being a horned owl. I do not think that there is any possibility of a rat's having been inside, though one may have crawled up the wire outside and run over the roof. It is still a mystery.

During the last three nights Archie has slept in the bed intended for Terry twice and in his regular one once. Terry was put to bed each night in the place not occupied by A. He will not even look at his old place.

No dispute arose between them on account of their being placed in each other's beds on the 16th.

Terry repels A from my shoulder.

On the 18th. Archie again tried to roost for the night on my shoulder when T was already there. Contrary to experience of the 16th., this time Terry repelled him with a sound blow on the wing, causing A to lose his balance and drop to the floor.

In discussing with Dr. J.M. Linsdale the sunning habits of the road runner, he suggested that I endeavor to determine with a photometer (of the Weston "Photronic" Exposure meter type) the intensity of the illumination that brings about the reaction. (I had explained to him my conception of the two types of sunning postures: The "hollow bowl" type apparently used with sun of moderate intensity, and the "spread eagle" type seen only (by me) under rather strong sun).

As a rough preliminary, this morning (19th) Rhody being present and all three roadrunners being exposed to the same illumination and in plain sight near at hand, I used Terry's back as a standard surface _from_ which to measure the intensity of the light. (It is probable that the best way would be to have some standard surface, such as magnesium carbonate--a good standard of white--and take continuous readings of the light reflected from it while watching the reactions of the birds.) Terry did not prove a good standard. In the first place, both he and Archie insisted upon occupying my shoulders at the same time when I sneaked up on them with the meter, leaving me foolishly pointing the meter at nothing. In the next place, when he did get down and dispose himself favorably (Archie remaining perched upon me during the whole performance) I found that, even with constant illumination _upon_ him, radiation _from_ him varied according to the extent to which his back was exposed by the parting of his wing coverts, because his wing coverts are better reflectors than his downy back feathers. The morning was really ideal for the purpose because clouds were intermittently passing over the sun and the birds were responding like automatic thermostats. Archie, naturally, I could not see well, but when his feathers began to tickle the inside of my ear, I could judge more or less of the extent of his expansion. Terry, at arm's length, and Rhody farther away, I could see plainly.

The affair was, of course, very rough. Nevertheless, while as expected, the three birds did not synchronize absolutely simultaneously, since they have wills of their own and are not mere automata, their responses to the varying illumination accommodatingly provided by the sun were so nearly alike in time-phase as to furnish a really funny show, especially as they were so serious about it and did not realize how comical they were.

One thing was quite clear as to all three birds: Response

to increasing illumination was more prompt than to decreasing. That is; They "opened up" more quickly as the sun came out than they "closed up" as it went behing a cloud. Also the extent to which the wing coverts were separated varied with the illumination. The stronger the illumination, the wider the opening. Thus: (These figures are necessarily inexact) at about 20 or 30 foot-candles from Terry's back, there would be indications of his "splitting down the back". As it increased to say 50 he would open wider. If it increased to about 90 or 100 he would open up as wide as he ever does. As it faded, so did he close accordingly, but with somewhat greater time-lag. When the sun went completely behind the cloud and no shadows were cast he closed completely, but not until the illumination was less than that at which he opened, say 10 or 15 or thereabouts.

The birds are very accurate in their orientation toward the sun at relatively low illuminations, less so at higher. That is: At say 50 foot-candles, their back are squarely placed to the incident rays. To insure that this shall be so, they frequently make almost micrometric adjustments if they have not placed themselves accurately on first trial. At illuminations of say 100 they are not so particular, and at still higher they may even shift somewhat to decrease the radiation received per unit of area. However, the time element enters here, and the sense of satisfaction of the bird. Also, presumably, the air temperature. Naturally, if the bird has warmed his back to his satisfaction, he is not going to keep himself split down the back, sun or no sun. And if the surrounding air temperature is such as to meet with his ideas of comfort and no need for radiant heat is felt, he will not open up.

All of the foregoing is, of course, in a quantitative sense, not to be assigned a high degree of accuracy.

The figures given seem low, but it must be remembered that the photo-electric cell is measuring light coming from the bird's back and not that which is falling upon it. The bird's back, insofar as absorption of radiation is concerned, probably approximates the physicists so-called black-body. It is also a good radiator of heat, but a poor radiator of light. The cell measures intensity of light, not heat.

During this crude experiment the light coming from a white cloud about 90 degrees from the sun (the sun being obscured at the time) was about 900 foot candles. As a guess, a smooth surface of magnesium carbonate placed beside Terry when the sun was out fully would have given an indication of the same order.

The air temperature, though not taken, was probably about 60.

At no time were light and, or, temperature conditions sufficiently intense to induce the birds to use the spread-eagle posture, nor, for that matter, is it believed that there is an absolutely sharp line of demarcation between the sets of conditions determining which posture shall be used.

?

February 20th to 25th, incl.

During this period there was rain every day except the 25th, ending a stretch of 17 (.) days on each of which rain fell, popularly considered a record. Although it is not, there are few instances since official records have been kept, where it has been equalled.

This condition of affairs has not made nesting of the thrashers progress very rapidly and although little work on the nest has

been seen during the last week or so, Brownie can usuallly be found in the neighborhood of the nest.

On the 23rd, still pictures were taken of Rhody drying himself between showers. (P.1119 A). He was not heard to sing when it was actually raining.

On the same day he appeared at the cage at 9 A.M. bearing a lizard and wagging his tail sideways--the first appearance here this year of this courting procedure. I was hoping that he would offer it to one of the youngsters, or do something that would indicate that they were considered as possible candidates and, perhaps, at the same time throw some light upon the sexes of the two. While he stood facing them outside the wire, wagging his tail, he made no definite offer, and few minutes later, when on top of the cage, made no further advances.

When he wandered off I followed for 30 minutes, finally leaving him still in possession on the lot to the west. On leaving he went down the lower road, occasionally stopping in front of some clump of shrubbery, facing it and repeating the tail wagging. At one place he also rattle-booed softly as if there he had at last found something, but he passed on to the Scamells', went up on their porch to the dining room windows, watched his reflection and wagged his tail. He then tried to get in through the window, but gave it up. Next he proceeded to "offer" the lizard in the same way to a motor-car standing in front . Gave that up, tried various other places; came back to the car; then to where Mrs. Scamell and I were standing, repeating, and so on until I left him.

There can be little doubt, bearing in mind last year's observations also, that this carrying of food (especially lizards) about while searching for a mate is a definite part of courtship, and the food is intended as an offering.

February 26th.

Rhody appeared at the cage about 9 A.M. not carrying anything. He "studied" the youngsters longer than usual and made a few short dashes at them--but he does this for the benefit of the magpies also, so probably no significance attaches to the performance.

Photometric Observations on Young Roadrunners

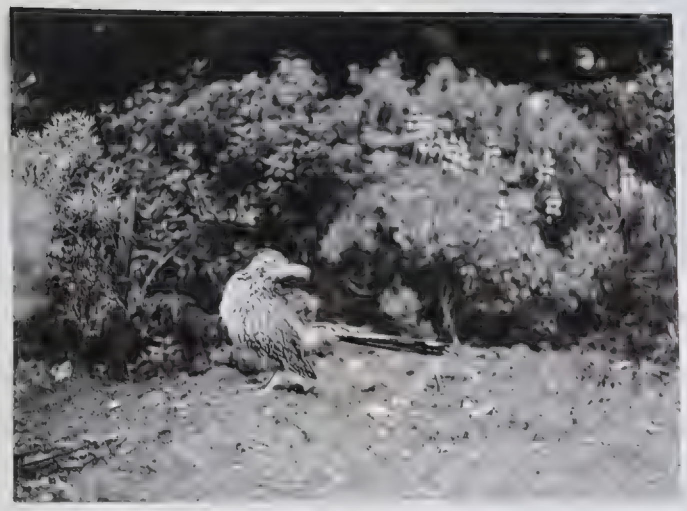
Clear, bright and warm with no obscuring of the sun at any time during the day.
Set-up consisted of a Weston Photronic Exposure meter, a thermometer (uncalibrated) and a sheet of white paper(Eaton's Souvenir Bond) mounted on a stand and directly opposed to the sun's rays. The thermometer was hung under shade upon the wire at the south side of the cage. Due to the exposure of the cage fully to the south and its northern side being entirely enclosed, temperatures within it are higher than the usual run of outside temperatures.

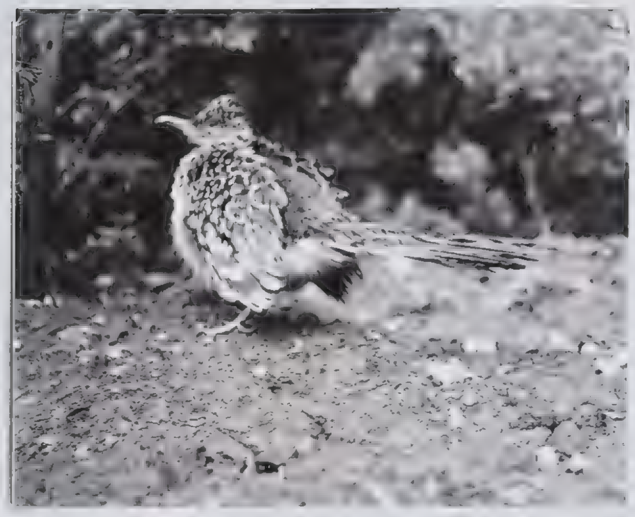
The reading of the meter varies somewhat depending upon the angular relationship of the sun-paper-meter configuration.

At the beginning there was time-lag (excessive) in the temperature readings on account of the thermometer's having been brought from a room where the temp. was only about 60.

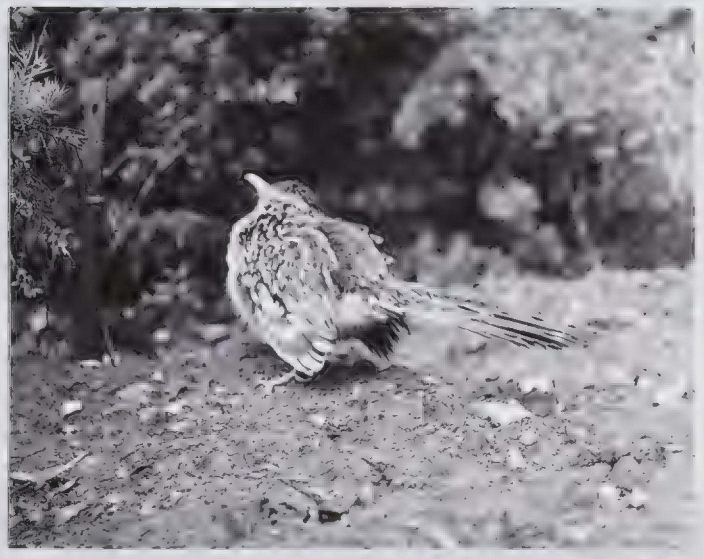
In the following where light is followed by a figure, unless otherwise stated, the meaning is that the intensity of light re-

[illegible]





[illegible] bill.



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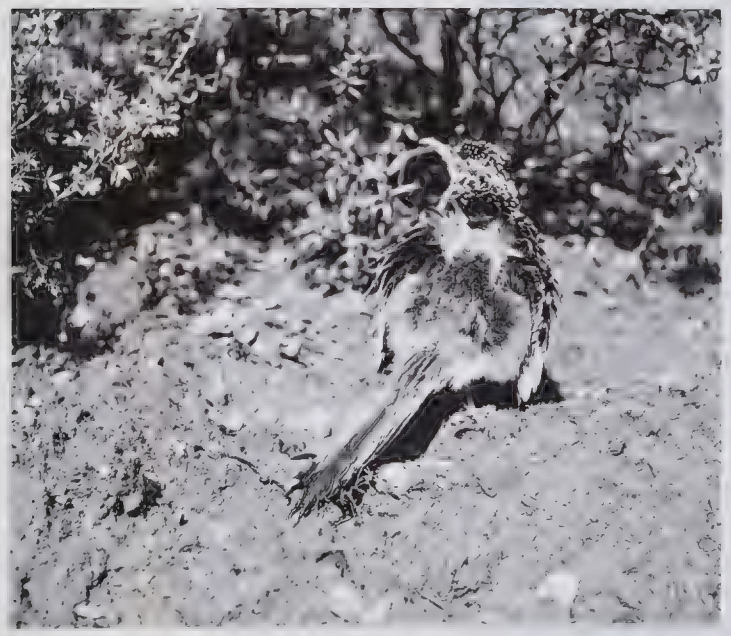
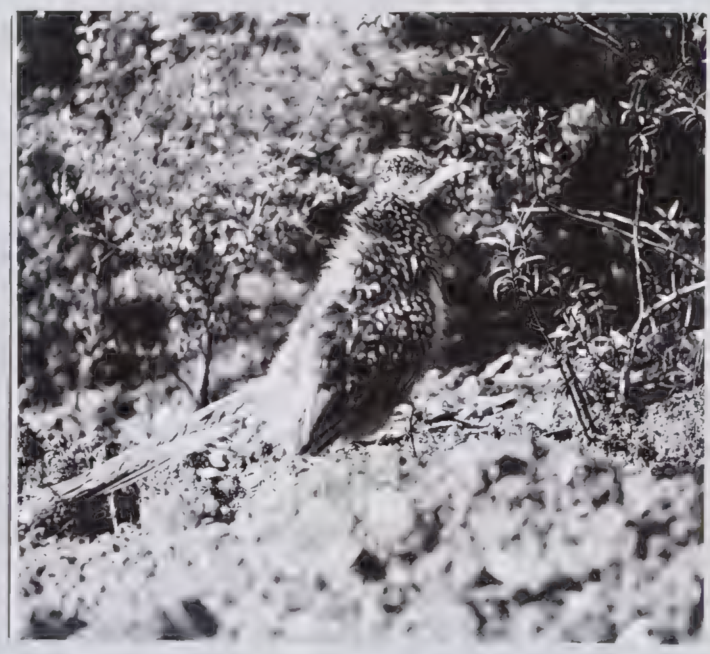
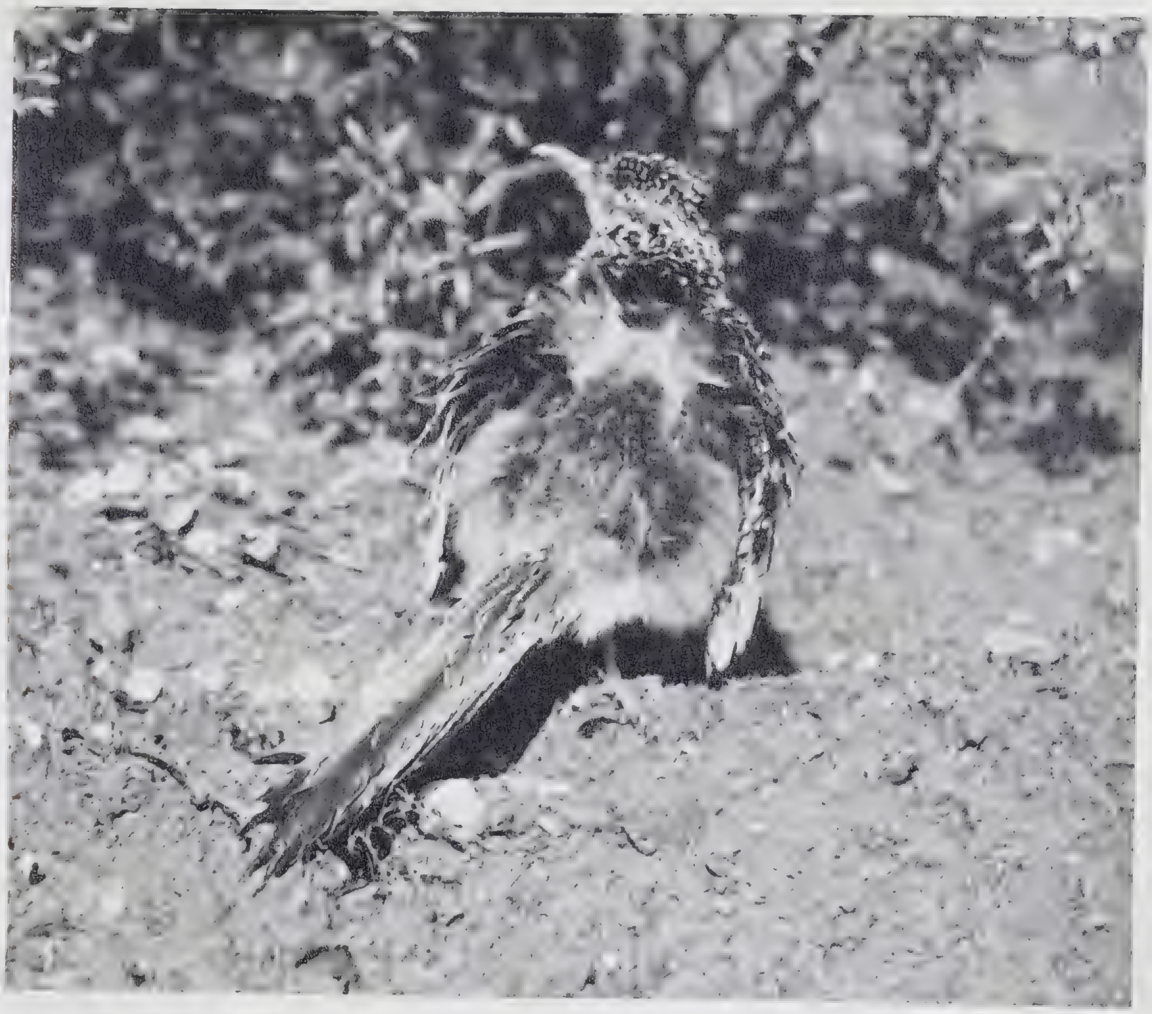


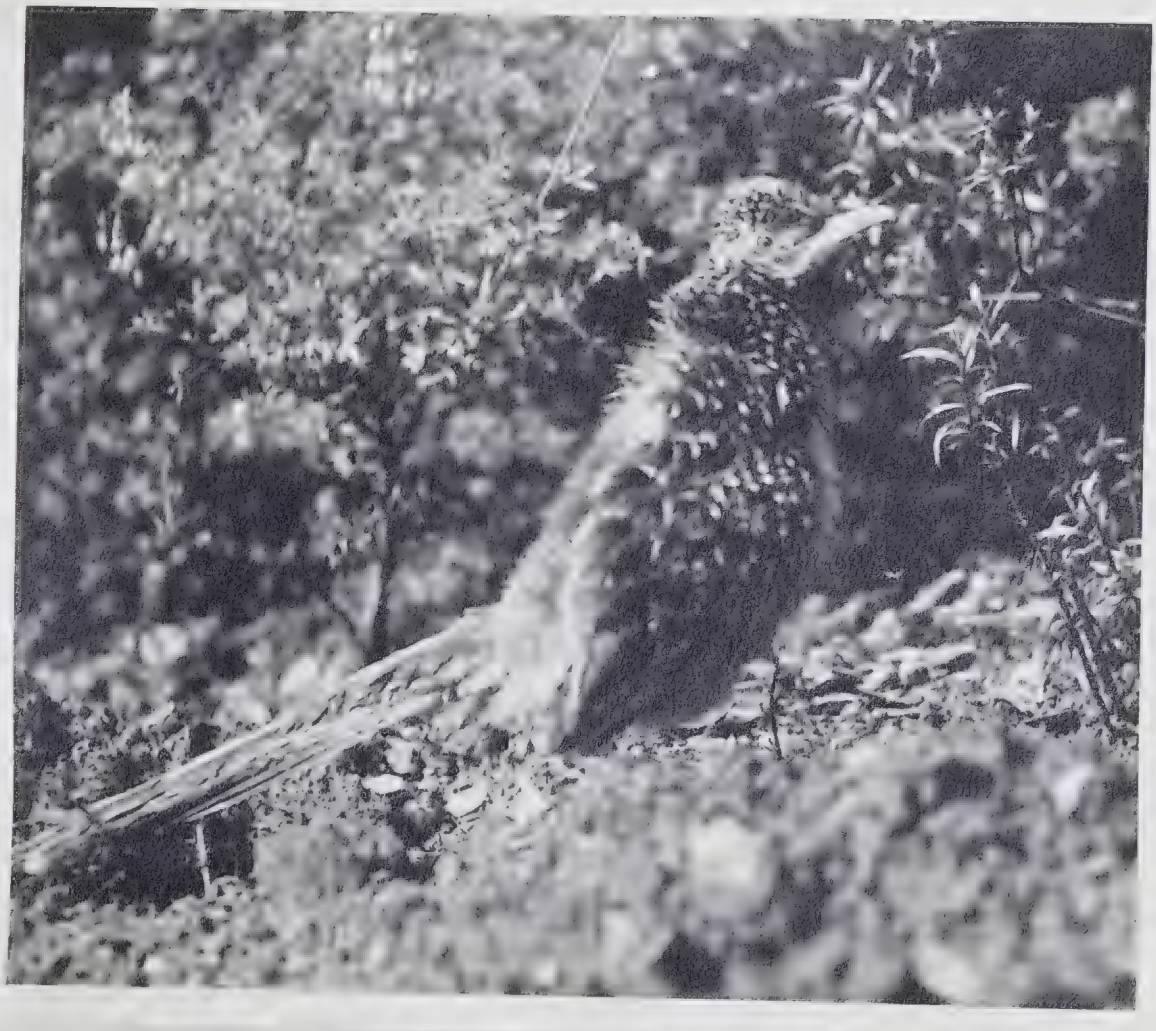
[illegible] his back.



[illegible] (side view).

This is the standard "open bowl" sunning posture. Note wet tail, dry back.





flected from the paper at the time of the observation was, in foot-candles, that represented by the figure.

1:50 P.M. Light about 900, Terry in sun but not "open". I.e.: not sunning his back with spread wings and wing coverts. Archie in shade. Temp. 66 (Degrees Fahrenheit).

2:07. Lt. 850, Temp. 69 (Not really rising, but time lag of inst.). Archie in sun, facing it, wings slightly drooped. T in shade partly "open".

2:10 Lt. 850, Temp. 70. A opens up, back to sun. T as before.

2:12 " " " " A moves so that shade is on back and sun is on breast and closes up. No change in T.

2:14 Lt. 900, Temp. 75. A moves into complete shade and opens up. Terry comes into full sun, opens up for about 20 sec., moves into shade and breeze

2:17 " " " " Both restless, moving about from sun to shade and seeming to prefer partial shade, neither open.

2:21 Same conditions. Terry begins to rattle-boo. Both run about quietly seeking some place different than the one they ~~are~~ were in and have short and frequent open periods of the order of 10 sec, after which they seek shade. Seem unable tolerate direct sun longer.

2:[illegible] Lt.1000, (I.e. the limit of the scale has been reached). Temp. 72. In and out of light and shade. Opening up a few seconds as they come out of shade. Not particular about placing their back squarely to sun. May be side to it. Archie shows signs of resorting to the spread-eagle, or hot weather posture.

2:43 Lt. 1000, Temp. 70. Neither sunning, preferring shade and now concerned about food.

2:45. Same conditions. Both showing partiality for partial shade and opening up there.

2:46. " " Archie makes T move on.

3:00 Lt. 900, Temp. 72. Under these conditions light measured from Terry:

Wing...90
Back 100 when covered by wings.
" 65 when open.

Both preferring partial shade.

(Temperature under oak in court in complete shade at this time: 60. Although thermometers not checked with each other under identical conditions, this difference probably about right owing to different exposure of the two points).

3:20 Lt. 1000.

Blue sky at zenith	100
Sleeve of gray coat	70
Light gray hat	200

3:45, Lt. 900, Temp. 69. Both having "sun-fits" of longer duration.

3:46 Conditions same. Archie saying ook, ook and bringing small stones and laying them on top of my feet.

3:49 Both birds now alarmed by the cries of children in the distance , partly restless and partly frozen, therefore not considering light and, or temperatures.

4:10 Lt.900, Temp. 65. Shadows of trees now encroaching upon cage. A picking warmest spots in cage in sun and opening up. T also seeks warmer spots and wants to go to bed on my Shoulder. (The earliest hour at which he has done this). This is about the time of day that they get restless.

4:15 Lt.900, Temp. 62 No change.

I went to look up Rhody, who had not appeared at the cage, contrary to expectations, and suspected that he was searching for his mate still and probably with a lizard. (I.e. had not appeared during this test). Found him on the railing of the Scamell porch with something in his bill that looked like a long, thick, hairless worm. Approach to 6 feet showed it was a very small. limp, tailless lizard. I had not seen Rhody since about 9:30 A.M. on account of my absence then and noon. Mrs. Scamell said he had been carrying it all day. Questioned further, she said she saw him first with it when a plumber arrived at about 10 A.M., that she had then been puzzled as to what it was he carried that was so small and had investigated and found it was a small lizard. Throughout the rest of the day she had seen him going and coming several times, always carrying this same lizard. She felt sure it was the same lizard. He sang with it in his mouth. (I have also noted this same action frequently). R showed no disposition to leave until a noisy truck climbed the hill, when he left. I went to his tree and he was in his night roost at 4:27. sitting quietly still with the creature in his bill. I talked to him, suggesting that it was now too late to find any takers and he had better eat it. This he promptly did.

I have no reason to doubt the substantial accuracy of the time of the 10 A.M. observation. (Mrs. Scamell, to verify it, asked her maid what time the plumber came, and was told: 10 o'clock). The fact that he put in no appearance, contrary to custom, between noon and the time when seen by me at the Scamell house, indicates a prepossession elsewhere not usually shown except when he is actively in search of, or in company with, a mate. And that is what, as indicated, aroused my special interest at this time. I also believe it not unlikely that he carried this same lizard for 6 hours or more continuously, extraordinary as it may seem. It is in line with last year's courting behavior, although it doubles any time interval then noted. In any case, without this incident, the lizard-carrying behavior of this particular bird, confined to mating season entirely, has already been established on past performance.

At 5:20 Rhody was still in his roost.

February 27th.

8:30 A.M. Lt. 750, Temp. 58 at cage, under oak 48. Both birds Both birds are making sunning with backs open the order of the day when at rest. Sunning is almost continuous. Terry lying down on porch of house in cage partly shaded, but open nevertheless.

9:25, Lt. 900, Temp 61, no readings since above. Temp. under oak 59. Both birds open continuously.

(At no time during any of the preceding observations, 26th incl., has either bird ruffled up its back feathers and preen gland has been entirely concealed at all times).

Mrs. S. fears an accident to R.

As Rhody had not been heard or seen this morning, I went in search of him at about 9:35. He was finally found sitting quietly 20 feet up in the Scamells' deodar, not one of his regular haunts.

He came down branch by branch on call, approaching me, booing softly, when Bonzo, the dog, made for him and he ran up the tree again hastily.

Mrs. Scamell then came out and said that much earlier in the day she had seen Rhody from her window out in the street, stretched out flat, all feathers tightly compacted, tail in gutter, head down, motionless and apparently dead. She resolved to salvage him, in pity. As she stooped to pick him up, he suddenly came to life and wandered off. (Undoubtedly he had frozen because of an enemy), as I explained, but she was still anxious as to his welfare. I then walked along the fence, looking up into the tree in an effort to find him, without success, until I lowered my gaze and saw him sitting composedly about 3 feet from my face, tail toward me, on top of the fence. My shoulder must have passed within inches of his tail. I flicked the end of his tail and offered him a generous chunk of Hamburger, which he gulped instantly and then waited for succeeding events calmly. I called to Mrs. Scamell to come and have a look at him at close range and satisfy herself that he was in perfect condition, but the dog came too and Rhody again climbed the tree to avoid closer contact. (He is now singing outside(11:20). When on fence, Rhody's back, open, Lt. 100.

10:20, Lt. 900, Temp. 62. No intermediate readings. Neither bird interested in sunning.

10:32, Lt. 725, Temp. 62. Increasing haziness. Birds sunning at times for short periods. (5 to 20 sec.)

10:45, Lt. 650, Temp. 64. Neither bird interested in sunning at all. (Note increasing temp. and decreasing light) but selecting warm places in which to lie.

11:35, Lt. 750. Temp. 63 A wandering about and rattle-booing, T lying in shade on porch of house.

12:00 800 65. Terry still lying at same place, Archie moving from place to place, saying boo very softly. Neither sunning.

[illegible],	Lt. 800,	Temp. 65.	Archie goes to rest in shdae, T as before.
[illegible]	900	64	Both come out into sun and open up. A for 1 minute (approx) then seeks shade on porch deserted by T. Patch of sun on left wing.
12:11	850	66	T still wide open; A comes out into full sun and opens.
12:12½	"	"	A turns side to sun to diminish insolation and partly closes; T wide open back to sun.
12:14½	[illegible]	[illegible]	T partly closes, maintains position.
12:17	"	"	A goes to partial shade, opens up there side toward sun. T turns side to sun and clsoes further.
12:19	"	"	T closes and faces sun.
12:21½	"	"	Both abandon sunning poses, fluff out all their feathers, including those on back for first time, and preen actively in full sun, T facing it, A back to it.
12:24	[illegible]	67	T as before, A in shade partly open.

(Increasing cloudiness since 10:32, mackerel sky to the south.

12:27	900	67	T as before, closed, A comes out to direct sun, facing it closed.

12:30 No change--observations suspended.

. . . .

1:09.	Lt. 1000.	Temp. 67	Both in partial shade resting. A on being disturbed, moves to full sun and opens for a few seconds, then to partial shade.
[illegible]	650	65	Both have been dozing in warm places, lying flat in part shade, slightly open, and continue thus.
[illegible]	225	60	Whole sky clouded, no shadows cast. Both as they were dozing, open about 2 inches.
2:54	(No readings taken).		Rhody and sun appear at the same time. Sun goes first. No further readings taken.

February 28th.

At about 8:30 A.M. (bright and clear) I went to the cage temp. there 58; both birds, as is the usual case with them, at this time of day, under like or lower temperature conditions, with the sun shining into the cage at accessible places, were fully opened up in the"hollow bowl" sunning posture, back to the sun. This attitude, as is normally the case under such conditions, they maintained indefinitely without closing up at all. In the early hours after they leave their beds, in cool or cold weather, with sun, after months of observing them, I do not expect to find them doing anything else. As temperatures rise they invariably sun less, move about or seek full or partial shade according to conditions. Under very hot sun, they are apt to sun themselves in the "spread-eagle"pose only; but this pose is rather rare.

Without attempting a rigorous, critical analysis of the foregoing instrumental observations and corolating them with their actions, it looks as if the sole purpose of the hollow-bowl posture is to secure relief as quickly as possible from cold , or, perhaps to experience an enjoyable sensation.

A little before noon Rhody appeared on the roof with a lizard and began a search of not less than three recorded hours for a candidate to receive the honor. He was observed at intervals until 3 o'clock, but after that was not checked up until about 5, at which time the animal was no longer in his bill. I took a telephoto motion picture of him sitting with it, singing, on top of the highest chimney of this house. He wandered all about with it , with the usual accompaniments. On one of his visits to the cage, about 2:40, I knew he must be hungry, and decided to put his self denial to test, since he still had the lizard, and incidentally determine whether the lizard had more value in his mind as food or as the roadrunner equivalent of roses and orchids. He ran to me promptly when I held meat out for him. Then ensued a severe strain on his mentality which was quite obvious. He certainly wanted the meat, but did not know what to do about the lizard. First he acted as if he would swallow the lizard in order to make room for the meat. This impulse was abandoned. He next took the meat, still holding the lizard, and partly turned away as if to use it as additional temptation for a prospective mate, thought better of it, laid both down and looked from one to the other. (It is impossible to resist the thought that some sort of a mental process was involved). Elsewhere, in notes on Bryant's paper on Roadrunners, following p.1118, I have given my reason for believing that lizards are Rhody's favorite food. Consequently, if he ate the meat and resumed his quest carrying the lizard, it would indicate a certain amount of self-denial on his part and a higher valuation placed upon the lizard as a love token than as a comestible. (More anthropomorphism). What he did was to eat the meat and then stare, as I thought, perplexedly at the lizard. At last he picked it up and again hesitated as if undergoing a mental struggle to fit his various impulses, reflexes and mental hazes into some sort of order which would result in appropriate action. At first it looked as if the lizard might join the meat, but the spirit of spring prevailed and he moved off with his funny little dog-trot (used when he is not in too big a hurry) and resumed his quest. Seen from the rear as he made off down the lower road to the west, with raised crest, he looked like a little drum-major with a bear-skin shako. For at least 20 minutes he still carried the lizard.

At exactly 5:04 he was settled for the night (Sunset 6:02).

The thrashers are giving little attention to their nest.

February 29th.

Rhody given mouse, which he decides to use as offering.

Rhody, on being called, sailed down to me from a tree in the lot to the west, receiving a mouse. He hrooed softly after taking it, and instead of eating it, apparently accepted it as his duty to go on tour with it. He is now, 9:41 A.M., making the rounds calling. I gave him the mouse at exactly 9:25. It had not occurred to me that he would not eat it, otherwise I would have given him one of the light gray hybrids secured from the University. He would not be able to duplicate this mouse and it would serve as a check on his operations.
(Sunny and warm, but a blanket of fog over the bay below).

9:15 A.M. Rhody appears to have disposed of the mouse; at any rate, he is calling from the roof of the Scamell house and it is not in his bill. He may, of course, have laid it down, as he often does.

RR sunning.

At 7:45, temp. at cage 54, roof still covered, Terry had found a beam of sunlight and was fully opened in it. A was in under the covered portion not open. I uncovered the roof, went inside to A; he stepped on to my hand and I raised him to a high roost where there was sun, and he immediately opened up.

At 10:30, temp. 71, both birds in full or partial shade. Temperature conditions are satisfactory to them and there is no need for sunning.

R answers my call in kind.

11:45. Rhody, who has been silent for a long time, was found quietly preening on top of the observatory, 30 or 40 feet up. I rattle-booed at him and he returned the compliment with the same call. No mouse visible.

At the cage, temp. 71, both birds in shade. They whine on my approach, with lowered heads, and Archie adds a deep hrooh, hroo

Rrs sunning.

At 12:55, temp. at cage 81, under oak 66, both young roadrunners sitting or lying in partial shade, closed.
Rhody on top of lath house in partial shade, in breeze (Back to it) lying down.

R selects meat instead of mouse.

When R came down I offered meat and a dead mouse simultaneously. He took the meat unhesitatingly and ate it. He had no use for the mouse. (Too long dead?). He retired to full shade to rest some more.

Next time Rhody chose the mouse.

At 3:15 Rhody reappeared at the cage without his any lizard. He was offered a freshly killed mouse and a piece of Hamburger at the same time. This time he took the mouse and ate it, reversing his former attitude.

March 1st.

Rhody was heard calling at 6:45 A.M. He was lizardless for a large part of the forenoon, but actively travelling about and calling. About 9:30 A.M. he sailed down from the roof of the Scamell house, ran steadily in the street toward, then past me, took the curve by the entrance grandly and hurried onward, disappearing around another curve to the south. Thinking he might have gone to investigate prospects at the Reynolds', I followed. By the time I got there he was already installed upon a chimney, directing his song toward Dimond Canyon and the country where he

nested last year. The distance traversed was of the order of 400 yards. It was covered quickly, and from the precision of his direction, it would appear that he had a definite objective in view.

By noon he was back here again, on the roof, calling, with another lizard. He finally went off with it (I was unable to note the direction taken on leaving here) but was back again in a half hour without it. He loafed around here until his bedtime.

March 2nd.

Rhody was calling about 8 A.M. (though he may have called earlier elsewhere). About this time he appeared outside the dining room windows, prospecting through the shrubbery, climbing the trees, investigating the interior of a gargoyle-shaped water spout that leads to a second story balcony. He then sat on the sill of various upper story windows, looking into the rooms. When I went up to investigate his activities, he huh-hrooed to me softly, deep in his throat as he reached for the profferred worm. Next he resumed his search in the branches of the trees and through the shrubbery below. Two or three hours later he was back again on the roof with another lizard. An hour or so later the lizard was missing.

The thrashers still pay little attention to their nest, and Brownie is not singing much, and then principally in the morning early.

Since the last night-alarm at the cage, the young roadrunners have continued to be uncertain as to their sleeping quarters, though Terry, for the last three nights, has adopted the new nest without being placed in it after dark. Archie has alternated between his old hanging nest and Terry's old shelf in the upper annex, with preference shown for the latter.

Sunning.

We have been having a succession of rather warm, clear days, temperatures at the cage running 80 to 85. Under these conditions A and T sun their backs only in the early mornings and evenings when the temperatures run a few degrees each side of 60, with occasional short periods of sunning after having been in the shade for considerable periods.

March 3rd.

Rhody, when last seen, was on the Reynold's chimney looking toward Dimond Canyon about 11 A.M. He did not come to the cage in the afternoon, though he was heard once or twice calling a considerable distance to the N.E.

At 5:30 P.M. he was not in his accustomed roost.
7:25 P.M. He is not there now.

All this, taken in connection with the shortened period of his carrying "bouquets", suggests that he may have located a partner, or that he is extendinghis search farther afield.

At no time has he appeared to consider either Archie or Terry as a possible consort. Whether this means that they are both males, too young, are recognised as being inaccessible or that he is restrained by too close consanguinity, or that he has pretty definite prospects elsewhere, is, of course, unknown.

March 4th.

R extends his search.

10:50 A.M. Rhody has not been heard near this morning, but at 9:45, from Dr. Reynold's house I could hear him (presumably) calling several hundred yards away across Dimond Canyon ; so he is searching far off.

Thrasher on nest

A half hour earlier one of the thrashers was sitting quietly in the nest.

rry whines at rchie.

On returning here Archie and Terry, as now the regular thing, whined plaintively on my approach. Archie flew up to the sand box in which T was sitting, carrying a small pebble. He leaned over T and T raised his head and directed his mewing to Archie--the first time this has been noted. A dropped the pebble by T, nothing happened. This action may have been merely a concidence, but it is possible that it may indicate arousing of the reproductive instinct.

Aroused mating instinct?

& T's calling to me increasing in persistency.

For the last few days A and T have been very persistent in whining when I appear. Sometimes they appear satisfied on being given food or a drink, at others when I merely enter the cage; but often it makes no difference if they have just had a good meal. I worked most of the day on another extension of the cage where they could see me all the time. Yet they continued to call in this way repeatedly.

A's hroo heard on shoulder.

This morning Archie hrooed on my shoulder while sunning there, with his feathers tickling my ear. It is avery musical sound, not always of the same pitch. One phase of it is deep and guttural with vibrato, almost gruff.

Rhody back.

At about 3:30 Rhody had had enough for the day of his search in distant regions and returned home, unruffled and calm, unforgetful of the attractions of Hamburger steak.

At 4:25 he climbed up to his regular roost--an early retirement for this season--induced perhaps by the fatigue of climbing about the hills in search of a mate. (Sunset 6:06, bright, fair and summerlike, so there was nothing about the weather to influence his action).

March 5th

Rhody was not heard calling this morning at all. He came to the cage for meat at 11:45, and was much interested in the youngsters, watching them closely for about 20 minutes. Terry was rather indifferent to him, but Archie talked to him, raised his crest and approached near to him several times. Rhody seemed to (or rather did) pay most attention to Archie, and at one time tried to get at him by following up the wire outside. A's comments consisted of repeating hahk, hahk. R was silent.

I gave R a live mouse after he had eaten meat. He sat by the cage with it in his bill, quietly, for about 10 minutes. When he went off with it, I followed. He would trot slowly about 6 feet at a time and then stop, looking carefully in all directions. It was not until he reached a point in the street below about 20 yards directly in front of the Scamell house that he began to wag his tail sidewise. The Scamell dining room window is always an attraction to him and he ran over to it with the mouse and wagged his tail vigorously. His tail is so heavy that it also "wags" him. Incidentally, also, the pendulum-like swinging of a mouse

Carriage of head

The "grin".

dangling from the bill of a roadrunner, produces like oscillations in the body of the bird, which then swings about (in a horizontal plane) the bird's center of gravity. Also a mouse is sufficiently heavy to cause the bird to carry his head well back (somewhat like a duck). This gives him a proud bearing, on such an occasion. Further, as the birds gape is located as far back as the eye and the bill is not entirely closed, he appears to be grinning.

Rhody finally left the window and perched for 10 minutes on the railing of the porch, from which he has a good outlook. When he wandered off back across the street to the lot west of my house, I ceased to follow, but when last seen he still had the mouse. At no time did he call.

R back at cage again.
Larger than young birds.

At 5:45 he was back at the cage, mouseless, ready for more meat and another good look at the young birds. He is still decidedly larger than either of his off-spring.

He was not heard to sing all day.

Thrashers have eggs?

Every time I visited the thrasher nest today there was a bird in it that refused to come off. Normally this means eggs.
(But see note of Mar.6th).

Terry's tail.

Terry still has not lost two of the cut-off feathers in his tail. As all the others that were cut off were moulted, this suggests that, if the mature feather is merely a dead appendage, perhaps then, when the injury occurred to them, those that were shed were still growing and partaking of the life processes of the bird.

Brownie getting old?

For some time I have suspected that the scales on Brownie's lower tarsi and feet are getting much coarser. Examination shows such to be the case and the question naturally arises as to whether this is a sign of age. He is, I think, singing less than he did in former years: but only a careful comparison of notes can show.

March 6th.

Rhody was not heard calling this forenoon until after he had visited the cage at 9:30 A.M.

Today R gives most attention to Terry.

He came again at 1:10 P.M. (Perhaps earlier, I was busy in the meantime elsewhere). He again stared at the youngsters a long time and again went to the roof to get nearer to Terry (instead of A as yesterday). T seemed a little afraid of him, but hawked in approved form, while A was indifferent. Just the reverse of yesterday.

Thrashers changing shift.
Previous reports of nest unoccupied perhaps wrong.

A change of shift was observed at the thrasher nest at 2:15. I find now that a bird can be in the nest without being visible from the sidewalk below (or any other place) on account of the dense foliage. The nest can not be seen into from the ground and a ladder or a platform would be too public. Also the tree (bush) is too thorny to climb with comfort. From this it will appear that previous observations of the nest's being empty are not relaible.

March 7th.

Rhody called a little during the day from the chimney and elsewhere nearby and did not seem to wander far.

He climbed to his regular roost at 4:55. (Bright and warm, sunset 6:09). From this roost the entire western horizon between maximum southern sunset point and farthest northern sunset point is visible. This horizon is about 15 to 30 miles away. (The latte when the sun sets, as seen from there, behind the ocean itself). All three of his known roosts have had this unobstructed view of

March 8th.

Archie T and cat. At 7:30 a large cat was in the trap alongside the wire of the outer cage. A and T were in the inner cage with the door closed and could not see the cat. There had been no disturbance during the night. I let them into the outer compartment. They heard the cat mewing and went to investigate, but could not see it. Archie climbed to a perch to look down upon the trap. When he saw the cat, he cocked up his tail and uttered a rapid series of rattle-bugs. T climbed to my shoulder to have a look also, but did not appear to mind the cat. Suddenly Archie flew into a violent panic, caught his foot in a cord attached to a door that had become displaced, and hung there by one foot flapping violently. He freed himself before I could reach him. He had already cut his forehead again. He retired to the upper portion of the cage and remained in seclusion for a half hour or so, wary and watchful. Terry, strangely, since he is the more sensitive to untoward events, remained calm throughout.

Here is evidence of one cause of night (or early morning) alarms, and a probable illustration of the value of the roof covers in lessening their liability to occur. At the same time, it shows that only complete covering of the cage (or elimination of the predisposing causes) can prevent recurrences.

Sunning. By 8 o'clock it was already 72 at the cage. There was little sunning by either bird, and then only for a few seconds at a time and at long intervals. When the air temperature reached about 80, at the cage, where it remained until late in the afternoon, there was no sunning of the open type ("split-down-the-back", "hollow bowl") at all. Light from the standard surface, even in the early hours ran from 900 foot-candles to beyond the limits of the scale. (This instrument reads up to 1000).

However, about 1 P.M., with light at 900, temp. 80, Archie did the "spread-eagle" type in full sun. A few minutes later, Rhody, who had been loafing around most of the day, sometimes going off on short searches for a mate, came out of the shade and the breeze where he had been resting nearby, into the sun. Temperature conditions were such as to justify the expectaion (also Archie's example) that , if he did sun himself, he would use the spread-eagle method. He had n ot been seen in that pose for several (?) months, but I suggested to him verbally that if he were to run true to form and support my tentative conclusions (based upon previous observations) he should not use the open type, but the spread-eagle type, if he sunned at all; and this is exactly what he did. I gave him a mouse which he carried about (and off) returning in about 1½ hours without it. Light was now 900 and temp. 72. These conditions seemed to call for the open pose, in the event of his deciding to sun himself; and he performed accordingly.

From all of these observations, as well as from many not recorded in these notes, I feel justified in the deduction that, insofar as the senses of the road-runner participate in the action, sunning is resorted to solely for the purpose of warmth, and the pose adopted depends upon the temperature conditions of the immediate surroundings. In neither sunning posture is the preen gland exposed, nor are the feathers on the back and rump raised--except when preening forms a part of the act. Radiant heat is what the bird wants.

Terry did not participate in any of the spread-eagle poses, in fact was not seen to sun himself except during the early and late hours of the day. As a matter of fact, he was quite

curious about Archie's doings, seeming not to understand what it was all about, and once, when Archie was fully spread out flat upon the ground enjoying his "fit", Terry walked up to him and tapped him upon a wing, causing A to jump up in confusion, and run off hurriedly.

March 9th.

rashers changing
hift on B's call.

At 7:45 A.M. a thrasher was in the nest, but I could not tell which. On passing by it a few minutes later, a loud succession of musical phrases was heard coming from the nest. Answering scripping was heard to the nest. Shortly the "blue-bird" nest-approach call sounded, nearer and nearer; there was a rustling at the nest, Brownie flew out and to me for worms. His mate took his place, presumably Nova, but not positively known.

During the day, which was as warm as the day before, the road-runners followed the same practice in sunning.

Rhody continued his calling, using meat as bait this time and not seeming to go far away or staying long. I wonder if he has found a mate and she is nearby.

March 10th. 70°?

Rhody building
nest.

Only one change from yesterday: Rhody is building a nest about 50 yards from the cage in an oak about ~~2[illegible]~~ 12 feet from the east fence. At 2:45 P.M. I saw him disappear in that direction, followed shortly thereafter and found him actively at work, going up and down the tree at short intervals, carrying twigs and placing them in a veritable nest about 12 (?) feet from the ground. It is already big and firm enough for him to lie in it comfortably, but is still so thin that his belly can be seen through it. He showed no concern at my presence, but I left quickly without having seen any signs of a mate.

R's bedtime.

At 4:55 he was already at rest in his usual roosting place. (Sunset 5:12, clear and warm).

This nest result of
ere reflex?

The question now arises whether Rhody has a mate or whether, since he can now represent himself as a substantial property owner with a home free of all incumbrances, this building activity of his is intended as an attraction supplementing his own personal charms--an indication that his other efforts to date have been disappointing in practical results. Perhaps the nest is the expression of a reflex, or it may be a "cock nest".

Is this to be his only effort of the year, or will he, as last year, start several before one "takes"?

The nest site.

This nest is about 15 feet from the sidewalk, although it can not be seen from there. The canopy of the tree is dense and its interior without foliage. The branches are so disposed as to make the nest convenient of access for the bird and the support for the nest is very good. The location is well protected from the elements, it is warm; there is wide open field from north, three quarters around the circle through east all the way to west. The last quadrant, west to north, is occupied by oaks. Except for the possibility of human interference, it is ideal. The tree stands slightly apart from its fellows, has a clump of California Sagebrush (Old man, Artemisia Californica) and bush (?) lupine (the perennial woody kind) between the sidewalk and its base, forming a good screen. There is a permanent supply of Hamburger steak, water, together with an occasional mouse, 50 yards or so to the west at the cage where the youngsters are. (I wonder, by the way, whether the nest may have been started on the assumption that one of the youngsters

Youngsters the
inspiration?

could be induced to join him). Last but not least from my selfish standpoint; it is a very convenient location for me! For the next few days my problem will be: how to keep away from it and watch only from a distance. That will be as hard as to keep ones tongue out of the vacant space left by a recently extracted tooth.

Nesting preceded by examination of trees.

Of late Rhody has been giving a good deal of attention to the interiors of the trees about this place as if hunting for a suitable nest location, and it would now appear as if that was really his object.

First nest last year Apr. 1st.

His first noted actual construction work last year was on April First, at which time he had just acquired a mate. She was with him at the time.

March 11th.

R continues "singing", wing-slaps.

Rhody came most of the forenoon in the immediate vicinity of this place. At 8 A.M. I offered him some meat at the old oak, but he did not want it, so clapped his wings together over his back and sauntered away. He was seen to come to the cage during the forenoon

Easy bird-watching.

At 1 P.M. I was parked in my car in the street, about a hundred feet from the nest, at a point commanding the nest tree and its surroundings, as well as the nest itself. As cars are continually passing this point and parking nearby, my presence should not disturb the bird. Rhody, almost immediately came down from the tree, found several twigs not more than 20 feet from it and took them up to the nest at once. I could see him in it. This procedure was followed several times, but was varied by taking dead twigs from inside the tree itself. At 1:20 Rhody came out to the street, booed 6 or 8 times in rapid succession, ran south-west to have a closer look at a ground-squirrel that was sitting on its haunches at the sidewalk, seemed satisfied, turned away and preened in the shade of a shrub until 1:26, when he decided to go to the cage (as it proved). He was there when I got there, ate meat and then turned his attention to the youngsters, silently but watchfully, displaying a little. A and T both hahked at him, but T soon stopped and went to rest in the shade indifferently. R and A continued their interest in each other until Rhody went off to seek shade. All birds were panting. (Temp. at cage 92). R had hardly made himself comfortable before it became necessary for him to investigate the activities of a flicker eating pyracantha berries two feet from the ground and 5 feet from Rhody. The flicker fled. R next sought a closer view of some robins in the top of an oak 50 feet away, but abandoned the idea when the birds flew when he was half way up. It was next in order to drink. When finished he noticed a twig by the dish, picked it up and started in the general direction of the nest, gathering other twigs as he proceeded toward it. It was now 1:40 and I did not follow him. Nothing was seen of a mate at any time. R worked entirely alone. In the 20 minute period he made about 8 additions to the nest. I still wonder whether he is counting on one of the youngsters and have considered releasing one of them as an experiment.

R attracted by squirrel.

R and A and T.

Mutual interest R and A.

R attracted by flicker.

Robins next.

Returns to work.

Rate of work.

Does he think he has found mate?

When I went to the cage both youngsters came to the wire and meal; to Rhody they hahk.

2:20 P.M. I find that there is a straight vista through the oaks from the cage to the nest tree and, through it, at present Rhody can be seen up and down, down and up, hard at work. This, including the auto stunt, is roadrunner-watching de luxe. Now if

he can find a mate and convince her that the present location is the best, he will have a snap when it comes to feeding a brood.

R concentrating on Archie.

On going to the cage at 3:45, I found Rhody there looking at the youngsters. For 20 minutes more he either stood staring at them or following Archie parallel to the wires, at times posturing. Terry again was indifferent to what was going on. It looked as if Rhody might be courting Archie, but when, in the course of one of his marches, he came to a point where the magpies were at the wire, he turned his attention to them, and there appeared to be no change in his attitude toward them as compared with the young birds. At 4:05 Rhody commenced a ten minute rest in the shade. (Temp.75). Archie ditto; Terry was already so placed. At 4:15 Rhody took a long last look at his resting children, then strolled off to the west.

Shifts to magpies.

R already in bed by 5P.M.

At 5 I went to his regular roost and found him already in it.

Sunning.

No sunning by any of the three roadrunners, of any kind, was observed during the warmest part of the day. A and T sunned a few times for a few seconds each time around 8 A.M. and 5:30P.M. but not in between when I was at the cage.

A rough generalization on sunning.

As a rough generalization: When it is cool or cold, these birds sun their backs "all the time" when at rest, using the "hollow bowl" posture.

When it is warm enough to cause them to seek shade part of the time, they sun only on coming out to warm up, using the same method, but not for long periods.

When it is warm enough to cause them to seek shade most of the time, they are apt not to sun at all, but may, on coming out, open up for a few seconds and then change to the spread-eagle pose.

When it is distinctly hot, say 90 and up, and the birds pant even in the shade, then, curiously enough, they are apt to pick a good hot spot in the sun and spread out flat in the spread-eagle pose for minutes at a time.

Open bowl pose, see photo p.1119B

The "standard open-bowl" pose is well shown in the picture of Rhody, p.1119B. The scapulars (?) are reversed, leaving the skin exposed where the white tuft of feathers appears between the shoulders. Also bare skin is exposed in this pose where the wings join the body, but the preen gland--not at all.

Delayed note on R's spreading wings to rain.

I forgot to record it on the 23rd. of February when it occurred, but a sudden shower came up when Rhody was at my feet and he spread his wings as if to catch it, as A and T have been seen to do. When I saw them do it, I thought it was because the experience was new to them; but here we have an adult doing it.

Little thrasher song now.

There is little thrasher song to be heard now, perhaps an indication of B's preoccupation with household duties.

March 12th.

B does sing in A.M.

Last sentence above somewhat too radical as Brownie sings quite a bit in the mornings.

R continues calling.
R wants me to hold meat for him

Rhody continues his calling for a mate and nest building. He came to the cage at noon and when I offered him meat, changed his usual practice and instead of taking the whole lump at once, preferred to have me hold it while he took off little pieces at

a time. This may have been because he was not really hungry. He had taken a piece from me about 3 hours before out in the lot to the south, where he was calling. When he left he gathered twigs, breaking some to smaller sizes, and took them to the nest.

R brings liz-

At 2:45 he came to the cage carrying a blue-bellied lizard; after a brief survey of the youngsters he departed, still carrying the lizard.

He brings another kind of lizard.

No tail-wag.

ts it himself.

At 4:40 he was back again with a small alligator lizard. He went directly to Archie (the wire intervening) and it looked as if he were going to offer it to him. There was no sidewise wagging of the tail. When A became interested, Rhody swallowed the lizard abruptly "right under his nose". The next 20 minutes he spent in flirting with the youngsters and staring at them and resting on the roof. Normally he should have been on the way to his roost at this time.

Terry avoids R.

Takes refuge with me.

Terry was sitting on my hand placed above my head on a perch. When Rhody observed this, he walked along the roof to reach Terry. Terry did not appear to like this, dropped to my shoulder in confusion, whined repeatedly and tried to find some place under my chin to avoid Rhody's attentions. (R was making wild feints at hi

R's bed-time.

At 5 he headed for his night roost making comical poses with cocked tail by various bushes en route.

_ [illegible]

Cloudy, chilly.

A cloudy chilly morning (Temp.50) not clearing up until about 9:10 A.M.

No sunning.

Naturally none of the roadrunners sunned during this time. Rhody hung around the dining room windows, beginning about 7:15 A.M. and announcing his coming by a series of loud boos. He left after about an hour, half of which was spent resting under an azalea subjected to a chilly south wind, in "double shade"; a curious place for a sun-loving bird on a morning like this.

Curious resting place.

Weather makes young docile.

The young roadrunners were very quiet and more willing than usual to be petted.

R brings lizard. Adds meat.

Full courting gesture.

Carries lizard to Scanells'

Rhody was not heard singing (here) until the sun came out. At 12:20 he came to the cage with a very small blue-bellied lizard, which he evidently considered too small for an effective love token for he proceeded to add a lump of meat to his burden. Not until then did he use his courting tail-wag, facing first the youngsters and thereafter anything that looked to have possibilities. When he started off to the south west it was a foregone certainty that he would show it to himself in the Scanells' dining room window with tremendous side-sweep of his tail and posings. This bringing no results, he went straight up the front of the house, using wings and feet, to the roof via a second story balcony. This he did easily. On the roof he commenced to call, and an hour later was still there.

Returns "empty"

Courts young?

He came to the cage again "empty-handed" at 2:40 and spent 35 minutes in watching and displaying for the young birds, but not using the tail-wag. If he had used it I would be inclined to think that he was really courting them. (Archie principally). Perhaps he was notwithstanding.

Ignores mirror.

The mirror is so placed that he has to pass it within inches when he walks up and down the front of the cage, yet , now, he almost never gives it any attention.

When tired of this he went to the cage roof for a long rest and was not seen to come down until 4:45.

He was not seen working on his nest today, though I looked in that direction many times from where I was working on ht e new
the

extension of the cage.

March 14th.

Rhody was heard calling about 7 A.M. During the day he made half a dozen visits to the cage; some of considerable duration--half to three quarters of an hour. He did not fail to give the young birds his usual attention. It seems to me that his interest in them is becoming keener, but this is not certain.

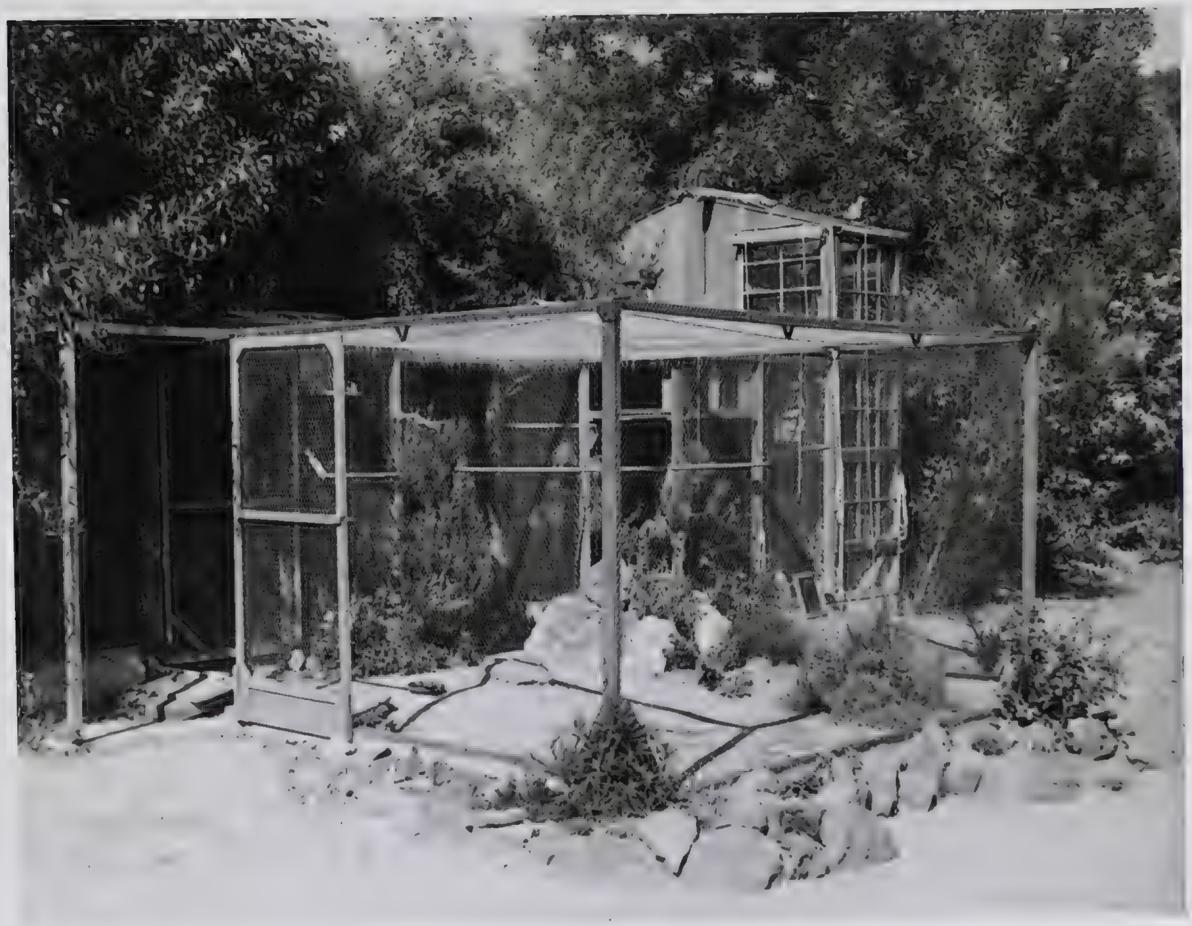
These affairs usually begin by Rhody and one or both of the young birds, usually Archie, following roughly parallel courses on opposite sides of the wire; Rhody occasionally displaying, but silent and intent; his vis a vis hahking and excited. After an indefinite time all calm down and rest quietly, placing themselves without reference to each other.

Rhody also worked on his nest and searched for a mate. When Mr. Sampson, who called in the afternoon, was leaving I went down to the street with him where his car was parked. Rhody appeared from behind it, unalarmed, with a load of what looked like pine needles and carried them to his nest, openly. There is nothing secretive about him. He had probably been inspecting Mr. Sampson's car, as he is very curious about automobiles when they are not in motion.

8:00 A.M. Well, Archie and Terry are sleeping tonight in separate cages. Terry in his old place in the upper story of the cage and Archie in the magpie cage, the latter being in the outer portion. (The night fair and warm).

About 5:40 I noticed that A and T were both restless, but attributed this to a mild fright that they had had when my sister and her daughter came to the cage an hour or so earlier. However, it was noticed that Terry was hahking as if Rhody were present--something he has never done before unless his father was at the cage. He had also scraped his bill and forehead again, just as I thought I had the old injury on the way to a cure after it had been in bad shape for several months. Rhody was not about. Then I wondered if, now that they are becoming mature, this hahking and restlessness was an indication that he was suddenly aware of something about Archie that he had only recognised heretofore in Rhody. The mystery was soon solved by Archie, who delivered a fierce and determined attack upon Terry and pursued him vigorously about the cage. Terry was plainly terrified and injured his bill still more. I stopped this affair temporarily but Archie was persistent, got T in a corner, unresisting, and made the feathers fly. Terry was pitifully frightened and rattle-booed time after time and would not let me touch him. Archie, rather surprisingly, would let me clasp his body in my hands and stroke him, but it was noticed that he was trembling. At this stage I separated them for the night. Oddly enough, after Terry had kept up his running about and booing while alone in the cage, until 6:30 or later, he took, for the first time in many weeks, his old place on the shelf in the annex that Archie had taken from him.

It is possible,then, that the present disturbance resulted from T's having attempted to reclaim this shelf, and that started the affair. On the other hand, particularly if it is true that roadrunners are solitary birds, it may be that adulthood is now bringing to the surface the intolerance of roadrunners for each other, possibly emphasised by the fact that it is mating season. I do not know at what age they are supposed to reach maturity. In any case they must be at least approaching it. If then their sex instincts are asserting themselves, does this incident indicate



The Cage (Rhody on roof)
August 1936. Showing 12' x 12' extension of March 1936
and upper annex of October 1935. See pp.1135 and 1080.

that A and T are of the same or opposite sex?

I have applied bismuth formic iodide to Terry's injury with a camel's-hair brush, having found in the last few days that this compound had promoted healing of the original wound. After dark it is not necessary to put him under restraint in the slightest when applying this material; he does not attempt to avoid the application .

Both young roadrunners are easily handled after dark, but the magpies, I find, fly about frantically if approached with a light, although they seem to direct their movements accurately.

March 15th:

Due to the early application of the bismuth compound, there was no thick blood-clot on Terry's bill this morning.

Both young birds whined persistently when they saw me approaching the cage at 7:30 a.m. Archie, on a perch, stretched his neck so far downward that his neck, back and tail were practically in a vertical, straight line. A peculiar, but typical gesture.

I went to see if Rhody was up at a little before 8. He was, and on my way back to the house along the street, found him on the sidewalk, cooing. He behaved according to seasonal form all day: calling, searching, working on his nest and visiting the cage. In the aggregate he must have spent nearly two hours at the cage where I was working most of the day. Perhaps only a quarter of this time was devoted to the young birds. On his last visit--more than an hour--he found a comfortable shady spot on the roof where he could watch the magpies, Archie and Terry and two of us building the extension. Roadrunners may be solitary birds, but Rhody certainly likes company. On an occasion like this he does not mind the hammering and moving of things about within a few feet of him and looks bright and interested, and it is not necessary to restrain ones actions for fear of alarming him. He is getting tamer than ever and, this afternoon, at one time there were eight of us at the cage at once, yet he did not leave.

As recorded in these notes, I discovered some time ago that Archie is as good at catching worms on the fly as Rhody. Today it occurred to me to try Terry and I find he is just as good as the others. As an experiment I held a worm about 2 inches above his bill (which he was holding horizontally) and dropped it. He caught it as it was passing the tip of his bill, lowering his head slightly in the act. Say he lowered it an inch. Then the time interval between his perceiving the worm in motion and catching it was of the order of one eighth of a second.

In the afternoon the new 12' x 12' extension of the cage (see cross-hatched addition to sketch on p.1003, marked DEFG)+ was far enough along to permit of A and T being allowed to enter, the wire netting along DE, being entirely removed. Along this line there has grown up a hedge-like row of baccharis, mimulus, etc., self seeded. This has been kept down to a height of about 18 inches. Archie and Terry have been accustomed to this hedge as marking the limit of territory available to them, since it coincided in position with the netting. They have a regular path along it, through doors 2 and 3, into cage B, turning there and coming out again. This hedge they often inspect for insects, but know only the cage side of it, although, by craning their necks, they frequently view the outside world over its top. When the netting DE was removed they continued to run along the inside of the hedge as usual, but looked over its top frequently as if realising that there had been some sort of a change and that there was an attract-

+ Also photo. page 1135A

ive space just beyond which they would like to enter. However, their inhibitions prevented until one of them discovered a gap at D which the presence of the former platform (now removed) had concealed from them during their occupancy of the cage. Through this gap they went, and for an hour or so, it was the only route they used, until Archie jumped over the hedge. Even then, though they had now two methods of getting into the new territory, the hedge remained a restraining influence all the rest of the day.

This initial jump of Archie's had an interesting consequence. For the first time in his life he found himself one one side of a low bush and Terry on the other. This acted like a trigger to put into operation an instinct or a reflex (I suppose) that had not previously come into play, for he immediately acted precisely as does Rhody when he comes to the cage to see the youngsters, crouching, feinting, displaying and dodging about facing Terry, who sat calmly on Rock 1 (See p. 1007) staring at him. This was all new,--seen for the first time. I half suspected that it was Rhody, somehow mysteriously getting inside the cage. Even my Filipino boy, Julio, got a "kick" out of it and said:"He is imitating Rhody!" To one who has known both of these little fellows since they were eggs, this little episode was a distinct event

This again adds another link in the lengthening chain of evidence leading to the conclusion that Archie is a cock roadrunner. From the very first I have thought he was, but "he" may be a hen. Terry I have always "felt" to be a hen, but"she" may not be I am still hoping that Rhody will somehow furnish the clue.

March 16th.

A little before noon Rhody was on the Sewell house with a lizard scanning the landscape for prospects. Evidently he places great reliance upon the chance of seeing a roadrunner if he watches carefully.

Some hours earlier out on the sidewalk with a stick headed directly for his nest. He seems to take no precautions whatever to conceal his operations.

He brought the lizard to the cage about 1:15 in the presence of a visitor. I went to him and offered him meat, and (another "first time") he wagged his tail , apparently for my benefit, with long powerful side-sweeps, pointing his bill toward the ground with head carried far back and pivoting his body from side to side--his courting gesture.

The new cage extension gives him a fine, clear view of the youngsters and a good long beat along three sides, enabling him to maintain closer contact. This was well shown on a later visit.

This time he was so intent upon watching A and T that he at first ignored a piece of stout string that had caught upon both feet. As he ran about it became more securely entangled, so that he was hobbled and his stride shortened. I did not see how he could get rid of it and had visions of having to catch him and cut it off. I expected him to lose his head and become panic striken, but he did not. At last when he could tolerate it no longer, he stopped in front of me, within eight feet, and with surprising coolness and precision, attacked the problem rationally. He began on his right foot, raising it from the ground and disentangling that one first. As far as I could see he made only one mistake, and that was to pull on the end of the cord first, thus tightening it, instead of taking hold of a bight. However, he immediately changed his tactics and pulled on a loop, which, no doubt by pure

chance happened to be the key. That foot free, he cleared the other in short order. Next he raised each foot in turn from the ground and examined it carefully, probing with his bill as if to see if any damage had been done. He then looked in a casual sort of way at the cause of the trouble.

Here was a situation that would have thrown some birds into a state of wild, unreasoning fear with uncoordinated peckings and flutterings. It really was (or might have been) a serious matter. I do not mean to infer that Rhody reasoned about it or analyzed the convolutions of the tangle, but he certainly went at it in a matter of fact, workmanlike manner, coming out of the ordeal in full possession of his faculties, ready to catch on the fly the first worm tossed to him.

March 17th.

Sunning.

At 7:30 A.M. (in the morning chill) Archie, Terry and Rhody, who was also present, were all sunning, open style. Temp. under oak 55; not taken at cage. With all three birds, except when in motion, this pose was held continuously for an indefinite time. Under these conditions of light (no reading taken) and temperature this may almost be considered the normal posture when at rest.

Besides the two poses to which special attention has been given, the birds also lie in the sun without making any special disposition of wings and coverts, although, when lying down there is a natural tendency for the plumage to open up somewhat along the back. When in this position, the bird may face in any direction with reference to the sun.

Rhody did very little calling during the day and seemed to spend most of his time in the garden and the orchard, together with perhaps two or three hours in the aggregate at the cage. On some of his visits to the cage he did not seek food at all, his interest being concentrated upon the young birds.

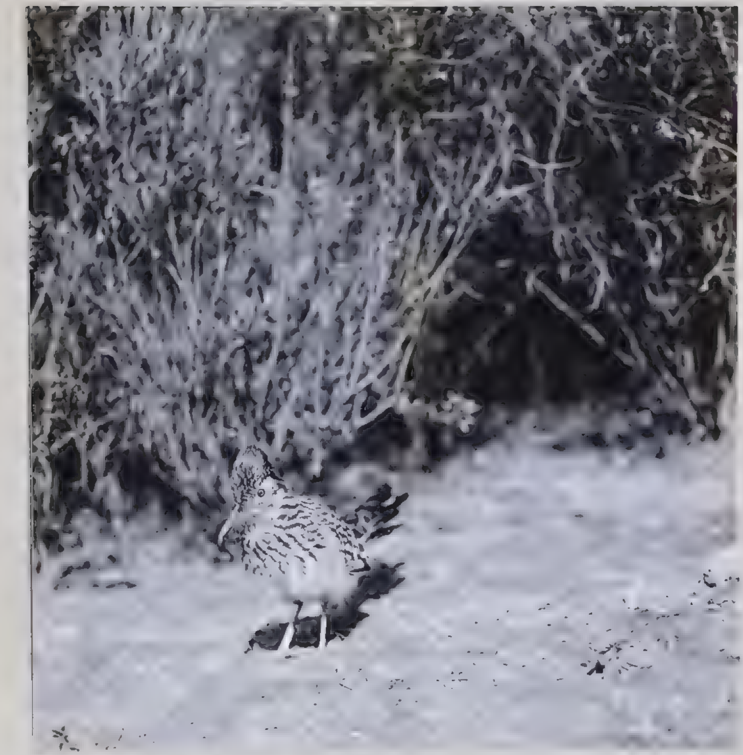
There is little doubt, now, that his interest in them, now, is of special character, based upon their being roadrunners and not merely birds. From day to day his visits have been increasing in frequency and length, There is an element of pathos in the picture of him standing silently outside the cage looking at his progeny longingly, missing none of their actions and springing into activity when one of them approaches.

He was not seen working on his nest during the day.

nd T show first inclination
o build a nest.

At 1 P.M. Archie was in the hanging roost m-ing continuously, with lowered head. It was so long sustained that I went in to observe more closely. I first offered him food, but that did no good. I then offered him a twig which he took. (They usually will) Terry, who was perched in the upper extension, became intensely interested and came down, taking Archie's place in the "nest", as Archie left on seeing his approach. This, in itself, was behavior out of the ordinary, so I handed Terry a twig. This he took at once, and instead of shaking it about and then dropping it as both birds usually do, he placed it carefully in the sleeping place, pressing it down firmly with his bill. He did that deliberately and with apparent design with each of a half dozen twigs that I offered him and, between offerings, cried for the next one. I went out and got more twigs and placed them on the ground. Terry came down, got one of them, and took it up into the upper annex where he dropped it. Archie took one of them up into the sand box. No further activities along these lines were observed at this time, but later in the afternoon Archie was seen in the nest moving the twigs about that were already there.

Snap shots of Rhody, March 1936, out in the "wilds" of the West lot.



As has been noted previously, the "crying" of these young birds has been on the increase recently and I have been puzzled to account for this seeming reversion to second childhood. (Although it should be stated that they cry much more now than when were squabs). Just before the nesting incident both birds had had ~~had~~ rice to eat, and Archie had eaten a second one (unusual) just before he began moving the twigs about in the nest. This crying has seemed to me to be the expression of a want which I was not able to satisfy. In the present instance, as in innumerable others in the past, food was not the object. Usually my entering the cage and talking to them stops them, but it may be renewed as soon as I go out. I have often wondered if the unknown "want" which seemed to be partially satisfied by my companionship, was not really an indication of the awakening of the sex-instinct. The foregoing incident lends some support to that view.

"Points" of A an T and Rhody. Rhody is still, in every way, by far the largest of the three birds.

His skin-pattern is much more bright in the red, but differs little in the blue.

His feathers are more colorful and the colors more saturated.

Archie seems to be only slightly larger than Terry, but his tail is longer and wider, even allowing for the two cut-off rectrices still, by the way, in Terry's tail.

Archie's red is more brilliant than T's and deeper in hue.

He is stronger than T. (Noted in [illegible]).
He is more aggressive, though still very gentle.
He takes whatever sleeping place he wants, irrespective of Terry's views in the matter.
He goes to bed earlier than Terry and is now rivalling Rhody in that respect, sometimes beating even Rhody to retirement. With him the interval between his retirement and sunset is growing shorter.

Terry cries more than Archie, but A cries more than he formerly did.
Terry is more shy of Rhody than A. Twice today, when Rhody got too close (say 2 feet), T came to sit on me.
He is gentler and shyer than A, and seems to like human society more.
He is less interested in Rhody.
Rhody is less interested in him than in A (?). Uncertain.
He tolerates handling more readily.

Both A and T are becoming more vocal of late, rattle-beaking more frequently and more times in succession--sometimes 9 or 10 times.
Neither has as yet made the adult coo-coo. . . . call.
Both now kroo oftener, sometimes on my shoulder.

In the last two or three days Archie has developed a new stunt, lying in one or other of the "nests" and snapping his beak softly and slowly as if experimenting. Sometimes he decreases the interval between snaps until it becomes a soft rattle. There is no voice with it.

hody and Brownie. When Rhody left the cage this afternoon at 4:45 (A had already gone to bed). I went to the orchard to see if he was going to his regular roost. (He was). He stopped when he saw me and c

to me. That meant worms. While I was giving him some, a rustle behind me announced Brownie on the worm ground. I gave Rhody worms with one hand and B sat on the worm-box in the other. They were thus about 3 feet apart. R pretended not to see B, but B was a little tense.

B has no young yet(?).

Since B took no worms with him when he left, that means he has no babies in the nest yet.

March 18th.

When I looked at Rhody at 7:45 A.M. where he was sunning his back, he rattled his back softly when I spoke to him--not a usual action. It is an odd coincidence that he should do this just as Archie has been developing the same performance.

At 7 A.M. Archie was in the other hanging nest, crying. He wanted me to hand him twigs. This done, he contentedly placed them with care, calling for more. Incidentally most of them fell to the ground.

Later in the day Terry wanted to work in the same place and was helped. This sort of thing happened several times during the day. So far they have accomplished nothing useful.

chie's new call.

Archie brought to reasonable perfection a new call that he has experimented with during the last three days. It is: Puck, puck . . . . . . etc.

R's action with lizard at cage.

Rhody brought a large lizard to the cage at 2:40 P.M. He carried it directly to a point as near to the two young ones as he could get, dangling it before them. They stared solemnly. He then ran off for a few fantastic evolutions in the bushes, returning shortly to repeat the dangling act. Nothing happening, he swallowed the lizard. I wonder what this means.

R was not seen working on his nest today, though he may have done so.

March 19th.

9 A.M. At 8 A.M. Rhody on the sidewalk outside sunning. He came for worms, then saw a butterfly on a lantana at Scougalls'. He caught it, tapped their window with it, then carried it to the roof, going up the front of the house. An Anna hummingbird buzzed at him as he went up.

A few minutes later he sailed down in response to call, landing at my feet. He was called down in order to show Mr. Sullivan how he catches worms on the fly. The demonstration completed, he ran and flew toward his nest about 150 yards away.

He *ma*-ed for my benefit several times between worms. Begging!

The young birds showed the nesting reflex a few times and Terry, each time that Archie was crying in the nest and taking twigs from me, was interested at once and approached the nest, A usually leaving. One time, however, as T arrived within 2 feet of the nest, I handed him a twig to see what he would do about it. He carried it to Archie making a clucking sound (the first heard) and held it over the edge of the nest where Archie could reach it, but A would not take it and T dropped it inside the nest. Previous observations of these birds would lead one to expect a repulse by Archie under these conditions, but there was nothing of the sort.

Terry now "pucks". Both birds were more than usually restless today, rattle-booed, mooed and puck, puck, puck-ed frequently. Terry, for the first time noted uttered this last call.

Terry also used the backward wing-slap once or twice. Rhody, ditto.

The backward wing-slap.

This gesture is generally made as the bird starts to run. As a preliminary it jerks its head and tail up sharply, spreads its wings horizontally --about half open--runs a few steps and then slaps the backs of its wings together two or three times, each time returning its wings to the horizontal, spread position and continues to move off with the wings so carried. The slapping is done so quickly that I can not be absolutely positive that it is the backs of the wings that contact. If it is not that, then it probably is that they are slapped on the birds back. (Not sides).

A and T answer R. A and T now, unmistakeably, do at times, answer Rhody's rattle-boos in kind

Rhody has not deserted nest.

Rhody has not been seen working at the nest for some time, so after careful scrutinity of the surroundings and failing to see any roadrunners about, I went to the tree. The nest was, to my surprise, more opaque to the light of the sky than Rhody's activities would seem to warrant. More careful scrutiny, however, revealed a big tail sticking out at one side, motionless, so now I know that he has not deserted the job.

Brownie scores again(?). At 6 P.M. Brownie suddenly appeared near the cage and began to dig furiously and much more earnestly than he has done lately. I headed for the nest in time to see B with something in his bill making for his old passageway under the fence, giving the "blue-bird" approach call. When I reached the nest observation point, the small branches about it were stirring. Circumstantial evidence, considering the lateness of the hour and his absorption in that particular activity, that he has another family on the way. Tomorrow should tell. (By observing what he does with meal worms).

March 20th.

B undoubtedly has babies.

8:30 A.M. Well, it looks as if the diagnosis were correct. I just saw Brownie skirmishing about for grub and suggested worms. I got a mild shock when he ate the first two, as it seemed to indicate no arrivals as yet, but the next one he prepared carefully on the ground and bolted for the nest, making the blue-bird call. By precedent, this means only one chick, and that very young, that is only one large enough to feed; especially as he did not come back for more. This one, then, on this basis of reasoning, would have been born yesterday.

A and T, nesting activities.

At 1:30 P.M. Terry was in the west nest crying. I went in and handed him twigs, which he immediately began to arrange, again crying "between twigs". Archie noticed this and approached the nest. (The converse of yesterday). I gave him a twig which he took to the nest, joining T there. Both birds then worked together amicably. At one stage of the proceeding Archie took hold of T's feathers at the back of the head, producing no apparent reaction. Shortly afterward Terry left and A continued to rearrange the twigs already in the nest. (This is the first time there has been any considerable coordination of their operations)

Both work on same nest.

T takes first twig from ground.

Terry, now on the ground, kept walking about my feet. I gave him a twig and he began carrying it all around the cage, on the ground, uttering a rapid succession of coots (as nearly as I can get it).

T's new call.

A peculiar call.

About 3 or 4 coots per second. The timbre of the note was unlike that of any other roadrunner notes previously heard, being deep and hollow as if there were a considerable resonance cavity present. The sound is not loud, audible perhaps 10 feet under ordinary conditions.

Uncoordinated nesting.

Terry carried this twig up to the nest from the ground. (The first time seen). When he came down again, leaving Archie still there, he was silent, but soon went up to the east nest and began placing twigs there which I handed him. It will be seen therefore that there is no precise, coordinated building activity at present, where site and concerted action are definitely fixed.

Both birds actively at it.

At about 5 P.M. there was the greatest activity yet seen at the west nest, both birds taking part, but demanding that the material be handed to them. Practically nothing is being done toward shaping the structure.

Rhody hung about more or less all day, but called little.

March 21st.

Little nesting by A and T.

The young roadrunners called for help on the nest only a few times today. Neither seems to have enough initiative to begin operations without calling for help.

Terry mas to A.

Terry is showing an increasing tendency to mas Archie as he does to me.

Rhody scared.

About 9:30 Rhody ran past the cage as if frightened, coming from the direction of his nest and carrying nesting material. He perched 30 feet away on the lath shelter where I first saw him, dropped his load and gazed apprehensively back along his route. He kept this up for about 15 minutes and then adjourned to the roof of the cage. In the meantime I made a search in the neighborhood of his nest and found nothing, but a few minutes later, a dog appeared nearby, that has been chased off of this place before. He is suspect.

R's song not heard here today. R also "coots".

Rhody was not heard calling here at all today, but he got a piece of meat which he carried about, presumably as bait. This time he paused in front of the cage and wagged his tail sidewise and made the coot sound that Terry initiated yesterday.

Brownie has at least 2 chicks.

About 1:30 I decided to have a look in Brownie's nest. It was a miserable, prickly half-hour job to cut my way through my self-inflicted "chaparral" on the south bank. The thorns of the acacia armata go right through ones clothing and those from the shade-killed branches inside go down ones neck. However, I got there, finding Brownie on the nest, somewhat resentful of my intrusion and not at all keen about worms. Furthermore the spirit of cooperation was not in him. I could feel wrigglers under him, but he sat tight. Finally he did take a worm and gave me a momentary glimpse of two chicks. What else, if anything, is in the nest, I do not know. Nova came to take over and was more bold than I have seen before. I feel quite certain it is she. Amongst other acts typical of her was duplication of her last year's pettish plucking at twigs on finding me at the nest. I got a very good look at her at 4 to 6 feet. Her eyes are the same color as B's. B would not get off the nest as long as I was there, but when I left, judging by the sounds, Nova (who carried no food) took on the job. It will be recalled that Nova has never had more than two chicks in any of her nests--unless this nest proves an exception. Even if I should be wrong in my identification, it has already been proved that thrashers, here, have the same mate for more than one season.

Nova.

Thrashers mate for more than one season.

B's flow of saliva. ?

Confirming observations of previous years: large drops of saliva appeared at the tip of Brownie's bill and dripped into the nest.

March 22nd.

B now busy.

Brownie's chicks are now developing an appetite that causes him to make frequent demands upon the Commissariat (represented by myself) and, at the same time more extensive digging operations. He is a busy bird.

Saliva continues to flow freely, sometimes dropping upon my hand when he perches on it in getting worms.

R at the cage.

I did not see Rhody until 1 P.M. when he came to the cage and remained there or thereabouts for 3 hours, sunning himself most of the time, as there was a chilly north wind, with bright sun. Before leaving he cut a few fancy capers about the bushes, rattle-booing as if to express his feeling of the futility of all things.

All three RRs intent on distant happening.

There was a period of about a half hour when all three road-runners were keenly interested in something out of sight to the south; so much so that I picked up Archie without protest from him and put him in my lap, where he remained throughout the period, looking south.

March 23rd.

R strongly attracted by young RRs.

There can be little doubt that Rhody is strongly attracted now by the young birds in the cage. At 7:50 A.M. he was on top of it sunning himself. I had to leave shortly thereafter, returning about 1:30, when I found him staring in the dining room window. In the meantime he had been calling.

R's mouse act.

The rest of the afternoon, for the most part, was spent at the cage. At 4 he looked so forlorn that I gave him a live mouse. He immediately began wagging his tail sidewise and bowing, then turning first to the right, then to the left and then to rear, repeating this performance at the end of each turn. He went away with the mouse, returning in 35 minutes with it. He ran directly to the netting where Archie happened to be standing, faced him and repeated his wagging and bowing, tail partly spread. This time he added vocal accompaniment, consisting of a series of rapid cooks, followed (as he bowed) by a crooning sound. At a distance of 15 feet I could just hear him by listening carefully. This is the first time that I have seen him so definitely court one of the young birds. Archie was indifferent and walked away. Rhody immediately ended his performance, straightened up and watched Archie retire. He stood thus quietly for several minutes looking, as I imagined, much disappointed. He wandered about aimlessly nearby for 10 or 15 minutes, sometimes remained perfectly still as if irresolute, still holding the mouse; but after his snub, did not even look toward the cage again. Finally he climbed a pine tree, swallowed his prey and stared off into space as I left. Poor Rhody. I wonder, considering that last year he started his nest on the first day he was seen with a mate, whether the presence of the young roadrunners in the cage deceived him into the belief that this year his objective had already been attained. Doubtless they had something to do with his nest building, but he still searches for a legitimate mate elsewhere.

He courts A.

Vocal accompaniment.

A indifferent.

R's disappointment evident.

Does R think he has found mate in cage?

March 25th.

R taking lining.

Rhody was seen taking pine needles to his nest, indicating

R also uses soap-root.

progress on the structure. He also used blossom stalks of the soap root, adding another bird to the list of those that find this plant useful in their domestic architecture.

RR uses salamander as lure.

A small salamander given him was used as a lure for a half hour or so, then brought to the cage, shown to A and T and then swallowed.

Young RRs want help at nest.

The young birds called for help at their nest a few times and would not work without it.

Brownie busy with his brood.

March 25th.

R suns and sings.

At 7:30 Rhody sunning himself and singing in a eucalyptus tree about 30 feet from B's nest paid no attention to B's goings and comings.

He changes pose when calling.

It was noted that, when he cooed, he first restored his wings to their normal position from that assumed while sunning. His calling was apparently not intended to be heard at any considerable distance.

R looking for new nest site?

He enables me locate bush-tit nest.

At about 9 A.M. he was seen to go up into an oak about 20 feet from the nest. I went there and found him inspecting the canopy of the tree in detail, as if to find another nest site. However, as there was a possibility of his being on a birds-nesting expedition, I waited to the end and was rewarded by seeing him pass directly under and about 2 feet below a bushtit nest, which his presence disclosed for the first time. Although it seems incredible especially as two tits came out of the nest, I doubt if he saw it. After continuing his search a few minutes more, he descended to the street and ran west, rattle-booing loudly. I followed shortly and found him sunning on the south bank about 100 yards away.

He greets me.

When I reached him he lowered his head and whined, repeating "between words".

He places twig in new place.

At 10:30 he was at the cage watching the youngsters, having, in the meantime, called from various points of vantage. When he left (in the direction of the nest) he picked up large twigs (note not lining) turned back toward the cage, thought better of it, went up an oak about 50 feet from it and, when I reached there, was going all about in the top looking for a place to put it. After inspecting various places, he selected one which looked (to me) like a good one, and placed the twig there carefully. When I left, he was on the way to inspect the operations of a flicker on the ground to the north.

March 26th.

B has 2 chicks.

Brownie's brood consists of but two chicks--a typical Nova performance, since she has never had more than two hatch successfully.

R rests in nest.

At noon Rhody was resting quietly in his nest. An hour or tow later he was taking up lining which he got from near the cage.

Terry most actively nesting.

Terry was the only one in the cage to display a nesting complex today. Twice he was very persistent in his calls for help and managed to stow away perhaps 20 or 30 twigs, one at a time, calling for each to be handed him. He was consisting in concentrating his work upon the west nest. In fact the other one has received no attention since since last noted herein.

Brownie now sticks to me.

B bolder in R's presence.

Brownie is now sticking to me like a leech. No matter where I am out of doors, he finds me . Even when I am in the roadrunner cage he expects me to take care of his wants. If I am not near the outside netting he goes up on top of the roof to get at me there. If I happen to be busy with Rhody outside, Brownie comes just the same. With R and B about 7 feet apart, a worm dropped about midway between them is secured by Brownie, so emboldened has he become now that the youngsters are making heavy demands upon him. If I pay no attention to him, he either jumps up on me or falls to digging where he can keep an eye on me to detect any signs of a more generous attitude toward him. On these occasions the slightest encouragement brings him at once. When he gets his "handout" he carefully prepares the worms on the ground nearby and with happy "bluebird" chirp, runs and flies to his nest only to be back again shortly.

Rhody not now wandering far. On account of A and T.

R and salamander.

Wig-wagging.

Offers it to young: abandons it.

Rhody is not going far on his courting expeditions now and is calling little. The presence of the young roadrunners in the cage, I think there is little doubt now, is operating to keep him more in the immediate vicinity. He was there before 8 A.M. and could be found there or thereabouts almost any time during the day. At 3 P.M. he was given a large salamander while on top of the cage. (These creatures are the most tenacious of life of any that he handles). After subduing it sufficiently to warrant his carrying it about, he immediately commenced his wig-wagging, bowing to right, left and rear with soft vocal accompaniment. It was again offered to the youngsters. He carried it about 2 hours, then laid it down to eat meat. It was then (another "First") abandoned, for the day at least.

Curious feature of performance

A very curious feature of this behavior of his is that he seems to need no audience, as he will go through the whole performance many times without any living creature of the bird-world in sight.

2½ months--no result.

I feel sorry for him: two and a half months of unrequited affections, and, as yet, no prospects in sight.

March 29th.

New Rhody behavior.

Rhody exhibited several new phases in his character today and has me about as much confused as his own mind appears to be. He was already at the cage at 7:15 A.M.

His abandonment of the salamander last night proved to be for good and all.

Uses twig as lure.

At 9:20 A.M. he came to the cage carrying a forked twig which he he seemed to use as a lure . When he left for his nest, he dropped this twig and picked up material (Old man) suitable for lining and took it to the nest. That was logical enough. He came back in a few minutes, while I was inside the cage giving mice to A and T. As Archie did not want his and Rhody was much interested, I gave it to him through the netting. (The omni present Brownie was there too). Rhody began his usual performance of tail wagging,

R and mouse.

Courts T

T interested.

R hopeless?

etc., then went off with the mouse, but was not heard to call. (He did not coo all day). He was back again shortly and very attentive to Terry, who was also interested. (It proved to be Terry's day). He carried this mouse until 2:30 P.M., at which time he ate it, "under the noses" of A and T, having evidently given up all hope of bestowing it upon a mate. There were periods of a half hour or more when he sat quietly behind the cage holding the mouse in his bill and looking off to the north, then would follow a similar

Postures at window.
Ignores mirror.

vigil on top of the cage, renewed presentations to Terry and posturings in front of a window in the cage without the young birds being near. Incidentally his regular mirror has been ignored entirely for weeks, though he sees it many times a day.

R searches trees.

About the time I expected him to be starting for his night roost he began inspecting the canopies of some of the low growing oaks in the vicinity of the cage. I followed him (and was in turn followed closely by Brownie!). (At times I had all three roadrunners and Brownie waiting for "hand-outs" from me at the same time). There seem to be several possible explanations of this searching behavior of R's:

Possible explanations.

Looking for birds' nests. (Though I have never seen him attack one).

Looking for food. (Though I have never seen him get anything in a tree).

Looking for a new nesting place. (This is quite possible)

Looking for a new night roost. (Especially plausible if sought near the cage).

A confusion of complexes or impulses due to the season and the time of day, embodying nesting and roosting impulses both.

Tries new location.

At 5:20 he started in the direction of his nest with a twig, very late for him. He dropped it and went up a tree about half way there, and went to a place that looked good either for a nest or a roost. He began moving small twigs out of his way and tried settling there.

R cries.

He occasionally cried softly. This is new on such an occasion. (For my benefit?). He came down and started to follow his usual route to his regular roosting place. I followed him.

On way to roost.

He is maddeningly deliberate and composed when doing this. When he reached the street, instead of crossing to the Scarnells', he kept on down the sidewalk going west, 5 or 8 feet at a time.,

Changes roost.

climbed the bank to the lot west of here, entered the brush, then came out again to stand 6 feet from me, looking and listening for 5 minutes, stock still. He then went into the brush again, so I went around the street corner and stood on the sidewalk below the tree in which he formerly had one of his three known roosting places. In a few minutes he was seen approaching the tree. At 5:42½ exactly, he began to ascend the main trunk, and at 5:50, he was in his old roost for the first time seen there in months.

In bed at 5:50

I hope for the night; but as I was getting chilly (Temp. 51) I left (Sunset 6:28--an overcast, chilly day).

A and T not working.

The young roadrunners showed no nesting reactions all day.

Brownie comes into this room.

Brownie continued to stick close to me when he needed food for his brood. At luncheon time he came into this room for worms four times. He has a bad time getting traction on the tile floor.

Strikes window for first time.

Once when he left he struck a closed window and smeared "worm-juice" on it. Evidently it is not safe to let him come in without taking special precautions for his protection. I might have lost him.

March 29th.

I look for R but he finds me.

Rain during the night, clearing at dawn [illegible] ([illegible]).

At about 9 A.M. I went to Rhody's various roosts to ascertain if he might be weather-bound, without seeing him; but as I returned along the street, he came sailing down out of my place and trotted to me without invitation, placed himself in readiness to catch ~~catch~~ on the fly the worms he knew would be forth-coming.

Brownie now appeared on the topmost snag of the old oak calling vaveu ting ting. He then sailed down for his share.

Pitch of A and T whines.

Proceeding to the cage, Archie and Terry set up an almost continuous chorus of ma-ing. It was noted that Archie, who was in the nest and was given twigs, was pitched lower than T, the interval being such as to harmonize, so that the effect was pleasing. (By comparing with piano, Archie was sounding G above middle C, and Terry C above).

B on cage roof after me.

As I came out into the new annex, a shower fell from the roof: Brownie walking there and trying to get at me.

A and T simultaneous sun reaction.

As the sun broke through the clouds Archie and Terry, simultaneously, pivoted to turn their backs to the sun and opened up as if interconnected by some invisible, positive linkage.

Rhody starts another nest.

2:15 P.M. Rhody was not seen or heard from about 10:30 to 1:50. He was then seen gathering lining material near the cage. He dropped this finally and picked up a forked twig, went over the north fence and climbed an oak about 50 feet from the cage and the same distance from a new house under construction. By a circuitous route I reached the same point. When I was still 15 yards or so away I could hear him whining. I located him sitting on a brand new platform. While I stood there he came down for more material and continued the work. Well, I suppose this is roadrunner custom. I certainly did not frighten him away from the first one, and he added lining to it yesterday. The fact that, just now, his first load was for lining purposes, would indicate that the first nest is still having some bearing upon his behavior.

The new location would be splendid (physically it is) if it were not for the fact, that, at times it is the center of a vortex of yelling kids, and, on week days, loud with the sound of hammers, falling boards, etc.

This incident indicates that, yesterday, he really was looking for a nesting site here.

As yet there are no signs of a mate.

March 30th.

Rainy day reactions.

9:40 A.M. Rain during the night and still raining.

About 9:15 I made the rounds to see what the birds were doing.

A and T. tractable.

A and T in the cage were looking pretty glum, all puffed out and inactive, but very tractable as is always the case in this kind of weather.

R seeks shelter.

No signs of Rhody. I went to look at the shelter provided for him last year (on the ground under the old oak). He was not there; but as I was wondering where next to look, he rattle-booed off to the west and came running through the rain, dashing immediately into his shelter, where I handed him meat. His body did not look very wet, but his tail was bedraggled.

B feeding.

Brownie, almost simultaneously, discovered me. He was pretty wet on the outside, but dry underneath; still he looked decidedly uncomfortable. He did not forget the needs of his brood.

R and salamander.

At 5 P.M. yesterday Rhody returned to the cage (I.e.. outside it). He was given a salamander which he used as a lure with the usual gestures. He did not go more than a few feet from the cage at any time until he went for the night. This time, he ate

Finally eats it.

the salamander (about 5:15) instead of abandoning it as he did with the one the day before.

No calling now.

He is doing no calling, does not appear to wander far from

R bases expectations of mate upon Archie and Terry?

here now and, it would seem, bases his most hopeful expectations upon the occupants of the cage.

Rhody comes in here.

At 10:40, as I sat here putting marginal headings in earlier notes, Rhody appeared at the window 8 feet away, looking in. These are French windows, opening outward. I could not open the one at which he stood without sweeping him off. However, I could, and did, open it a few inches without alarming him and handed him worms. When he shifted a little, I opened it fully and he came inside to catch worms tossed to him. He *brooed* softly. I hoped he would stay inside where it was dry and warm, but he did not like the sounds made by the opening and closing of water faucets ("washing") and retreated to the sill and later to the steps below. He left after 15 minutes.

A test of R's reaction to glass.

While on the other side of the glass I tested his recognition of it as an impenetrable medium by offering a worm in my fingers. He tried to take it through the glass, tapping the window in the act, but quickly discovered that the worm was inaccessible and abandoned the effort; but when I reached around the edge of the window, he took the worm from my fingers without hesitation. Thus in this instance, at least, his intelligence was sufficient to keep him from persisting in an impracticable enterprise, and that very quickly, and to readjust his action to a new situation that, optically, differed little from the first.

A half hour or so later he was found to have retreated to his shelter, but when Brownie discovered me, Rhody came running toward me. I enticed him into the tool-house, hoping he would find that shelter congenial, but he was nervous and again sought his shelter.

March 31st.

R works on new nest 2--36.

This day opened bright and fair and remained so.

Rhody continued to work at intervals at his new nest: Nest 2 of 1936, or, 2-36. Most of his spare time was spent in the vicinity of the cage.

R watches us dig. holding mouse.

R's reaction to passing bird. Freezes. 40 min.

About 4:50 he came and sat about 4 feet above the ground watching us digging up a small oak 15 feet away. He sat quietly with a mouse in his bill that had been given him a half hour before. At 5.10 a large bird flew swiftly along the ground behind him. He dropped the mouse instantly and froze. In about 10 minutes he turned his slowly to look off in the direction that the bird (hawk) had taken. This pose$ was maintained for perhaps 10 minutes, when he turned his head toward me, standing 8 feet away. At 5:50 he had not altered his pose, but at 5:50½ he began to thaw and preened for the next five minutes actively. During the preening four feathers floated away. He then moved two feet nearer me and then came down to me for worms. At 5:55 he left for his roost—a late departure.

Preens and feathers float away.

A frozen also.

All this was about 30 feet from the cage. When R froze, I looked toward the cage and saw that Archie was also frozen, but not Terry. A's tail was turned horizontally at right angles to his body, the tip having been against the wire netting at the time of freezing, presumably. This pose was maintained until about 5:50. I went in an examined him twice meanwhile and found him, each time, apparently in a hypnotic state, eyes opened fully and round. (These birds are always saucer-eyed when frozen).

R sleepy.

I should have recorded that, about the first sign of Rhody's resuming a normal state was when his eyes began to close sleepily, showing the commencement of relaxation.

Terry could not have seen the enemy from his position in the cage. Archie could have seen him, I am reasonably certain, only for a minute fraction of a second, since his only possible view was through a window less than 3 feet square in the back of the cage.

April 1st.

Rhody's wedding anniversary.

This is the anniversary of Rhody's first having brought his mate here and starting of the first nest last year.

Work on 2-36.

2:20 P.M. He is performing as usual today: No singing, but working in leisurely fashion on nest 2-36, visiting the cage and loafing.

Brownie's insistence

Brownie continues to tag me about. He is outside looking in at me longingly. 5 minutes ago, while I was inside the cage, he was hanging to the wires and walking on the roof to get at me. Just before that when I went to see if Rhody was working (he was) Brownie tagged along too. At lunch time he made regular trips between his nest and the table. Julio says that when I was away a few hours this morning B came into the house looking for me.

2:25. Just now I went to the shop, and his feet were heard on the obscure glass of the sky-light. When I came out, he was at me at once.

April 2nd.

B persists in tagging me.

7:45 A.M. Just as I sat down to write this note a "blue-bird" chirp sounded behind me--Brownie for more worms. Less than 5 minutes ago I was inside the roadrunner cage giving worms to the youngsters and he claimed his share through the wire netting. (Here he is back again. In the time to write the few above lines he has made a trip to the nest and return, a distance one way of about 150 feet). At 7:35 I was talking over the fence to Rhody, already working on his nest, and Brownie found me there.

ody's whine.

Rhody continued to work, but, when in the nest, answered me with whines. His whine is thinner than A and T's m-a-a-a.

As I approached the cage A and T greeted me with their G--O chorus. (Brownie back again for more worms).

Another RR?

At 8:40, as I approached the cage again, a roadrunner darted from the open into the bushes and I was unable to find it after a 10 minute search.(Not including the two nests). This was not like Rhody's behavior; it acted like a stranger.

R in glass house.

Absent from 9 A.M. until 3 P.M. Julio informed me that Rhody had not been at the cage often, but twice had gone up and sat for several minutes in the glass house in the dormitory tree--a small cabin never intended for so large a bird.

R takes lizard and meat to 2-36

Rhody appeared at the cage about 4 P.M. with a very small alligator lizard, added meat to his burden, and at once, began his tail wagging, etc. He worked gradually toward the nest, taking about a half hour to cover the intervening distance, which, from his starting point was about 25 yards. I approached very carefully, and from a considerable distance, could see that he was alone. He saw me at once and whined from the nest, later joining us at the cage, making no attempt to attract the young birds. They in turn were indifferent to him, being more attentive to Brownie climbing up and down the wires to get at me inside. Incidentally, Rhody, perhaps from observing Brownie, has learned that he can get worms from me through the wire netting of the roof.

R and young mutually indifferent.

April 3rd.

Rain during the night and a strong southerly wind during the forenoon with occasional showers and heavy rain beginning at 11:15 A.M.

Rhody does no work in rain.

Rhody not working at his nest at 9 A.M., but sitting behind (north of) the cage out of the wind. The branches around nest 2-76 were tossing about.

R in glass house.

About 10:45 it occurred to me to look in the glass house. Rhody was in it. (Looking for a place for another nest?). He whined at me, came out and tried Brownie's old place under the small roof behind the wind screen. He remained there just long enough to encounter the beginning of a heavy rain and when next I saw him he was completely wet externally. To my surprise he began what looked like a deliberate stalk of me, creeping directly toward me in stealthy fashion, like a cat. When he was about 3 feet from me he straightened up and seemed to look at my legs, but it occurred to me to look behind me, whereupon it was seen that the object of his attention was a crippled sparrow. At no time did he make a rush for it, and when the bird crept under a pile of lumber, he was but mildly curious, peering underneath. When the bird came out and fluttered away, Rhody did not follow-- though he saw it--but began a search under the boards--a curious duplication of similar behavior of A and T, under similar conditions, as noted herein.

R and crippled bird.

R in shelter most of day.

As there was much rain during the rest of the day, Rhody spent most of his time under the shelter at the old oak.

No work, no calling during the day.

April 4th. **The Serpent Enters Eden**

Rain ceased during the night, Rhody at work on the nest before 7 A.M. On coming to call, was found to be dry.

New action of A and T.

About 11 A.M., while I was in the cage watching A and T for any signs of mating, a tendency on the part of the two birds to keep on opposite sides of objects (including myself) was noted. There was a slight peek-a-boo tinge to their behavior.

Terry attacks A.

Suddenly Terry, the mild and gentle, made a rush at Archie, much to my astonishment, as all past behavior warranted one in the assumption that any such action would be initiated by Archie.

Archie injured.

Archie fled precipitately and a long chase was on, making me the vortex of a whirlwind. Archie's fear was evident and in his attempt to escape again injured his bill and forehead severely.

A fears sight of T.

From that time onward, whether Terry was pursuing him or not at the moment, the mere sight of Terry caused him to continue to thrust his bill through the mesh of the wire netting aggravating the damage already done.

I separate them.

A's morale gone.

As soon as I realized the seriousness of the situation, I separated them, but Archie's morale was gone and he continued his unreasoning panic. The magpies were hastily dispossessed of their home and placed in the small "oriole" cage where A and T as babies were given their first outing.

A given magpie cage.

Archie was put in their place, separating him from T by a wooden partition. He calmed down and rested on the ground, utterly exhausted.

No rest for A.

I went to lunch, thinking the solution found, but on returning, found Archie as bad as ever, a pitiful spectacle, head and bill covered with blood. He could not brook confinement within sight of Terry, as careful observation showed.

Archie released.

There seemed to be nothing to do but release him. Accordingly this was done, in the presence of Rhody, who had witnessed much of what had gone before. (Incidentally it was observed at the time that he watched the affair closely, remaining in one spot, as if aware of something portentous about it all).

Archie's reaction to freedom.
Rhody's reaction.
A's attitude toward me.
Rhody and A.
A leaves place.

Archie ran away from the cage when let out as if anxious to separate himself as far as possible from the scene of his unpleasant experience. Rhody, to my surprise, showed but slight interest, following A a few steps and then turning aside. Archie went down into the orchard where I found his attitude toward me unchanged from normal. First, however, it should have been noted above, that, during calm intervals in the cage, he permitted me, without holding him in any way, and without flinching, to wipe the blood off of his bill and palliate the wound. Later in the day Rhody saw me when Archie was with me, but could not see Archie. He came trotting toward me and suddenly saw Archie and halted abruptly. A was not much afraid of him, but moved off slowly a little distance, Rhody following quietly, but not trying to overtake him apparently. There was some changing of course and a little manoeuvring about, but no display, attack, or courting behavior. In this way they both eventually passed through the fence to the west and into the thick growth of the lot beyond my western fence. I had to leave about 5 P.M. and saw them no more this day. About 6 P.M. Julio saw Rhody, alone, sunning himself.

I did not like to let Archie go under these conditions, but saw no satisfactory alternative.

T not hurt.
Bearing on sexes.

Terry, it should be noted, showed no injury whatever, confirming the one-sidedness of the affair. I could not see that he struck Archie at all. My thoughts were very much mixed as to what bearing the incident might have upon a determination of the sexes of the two birds. I arrived exactly nowhere, because, obviously it might have been two birds of the same sex --either male or female--showing natural antagonism during the mating season. On the other hand, it might have been a male pursuing a female and the latter becoming frightened as the result of injuries arising from the narrowness of the quarters' preventing freedom of action. Yet it might have been the exact reverse. (See Brownie's experience of 2(?) days' pursuit of him by Phoenix(?)).(Somewhere in these notes!).

Terry displays for me. T a female?

Some light may have been thrown upon this phase of the matter by an incident with Terry after I had let Archie out. I went up to him and said:"I am going to spank you for making all this trouble." Accordingly I did, gently, of course. To my amazement, Terry at once crouched, spread his (her) wings, lifted his tail and became immovable! Never mind the pronoun! Whenever he showed signs of abandoning the posture, another touch restored it; or if he relaxed when I moved away, my reapproach brought it on again. This was all new to me. It irresistibly suggested a female inviting the attentions of a male, especially, I suppose, since I have always been biased in favor of Terry's being a female.

What is A?

If Terry is, what's Archie? Rhody did not appear to think he was a female. For that matter, neither did he chase him as if he were a male; so there you are.

April 5th. (Notes written 9 P.M.).

A brought back to cage.

Archie has had his first night out all alone, but he is now in the old magpie cage again, thoroughly screened from Terry in the other. Terry, also, has had his day out in the world and is now safe in Archie's old bunk.

This has been an eventful day in the local bird world.

Locating A.
He greets me.

At 9 A.M., with misgivings, I peered over the western fence down into the lot. There was Archie 50 yards away, safe and presumably sound. When he caught sight of me, he rattle-hooed and puck-pucked, but showed no other enthusiasms. I reached him by a round-about route, necessarily. He came unhesitatingly for

A friendly but tired and weak.

worms and was tame and friendly, but looked and acted tired and forlorn. As I sat beside him on the ground he showed that he is capable of feeding himself, as he found a snail, cracked its shell and ate the creature. His blows, however, lacked the old pep and his eyes were not alert and keen. His injury made him look strange.

I get water for him.

I doubted if he had had anything to drink, so returned to the house to get him water (in a bottle, with a glass to drink from). When he saw me approaching with the glass in hand, up the steep bank, he came at once and tried to drink from the empty glass before I could fill it, so thirsty was he!

Very thirsty.

I filled it hurriedly and he drank and drank and drank. It must have felt good. (Rhody meanwhile was up in the garden; showing lack of interest in Archie--perhaps ever since they had been seen yesterday).

R not with him.

I did not like to have him out there by himself in his weakened condition, so took him in both hands (under some protest at first) back to the house and released him in the upper garden near this room.

Taken back to garden.

He was not frightened, but came in here and inspected everything--a new experience for him--then down to the lower garden where he preened thoroughly, thence to the orchard for a good rest.

A comes in here.

Titmouse episode.

There Julio came and told me that something had thrown out nesting material from the plain-titmouse house and he thought a snake was inside. (This ties in with the roadrunners as will soon appear) Investigation showed the nest had in truth, been attacked, but the "snake" proved to be a parent bird inside that hissed when I opened the house. There were 8 naked youngsters, four of them crowded to one side and dying. Here is where it hooks up with Archie, for I took them to him, after repairing the nest, and he ate three of them heartily! Terry got the fourth.

A eats 3 titmouses given him.

Jay kills T.M.

As I returned, a California Jay was seen sitting on the perch at the titmouse nest. It flew off with one youngster in its beak. I found it had taken 3 of the four remaining. I rigged up coarse wire fabric over the opening to protect the last chick from the jays. As soon as I reached the ground a jay was at the wire.

I kill jay and rob its nest.

I shot it and looked for its nest. It was found 50 feet away--four eggs. I took it without mercy.

Rhody refuses jay's eggs.

Rhody appearing, I called to him and offered him the eggs. He looked at them curiously, but would not touch them, though he accepted worms. Archie did not want them either.

A ditto.

Terry rejects.

I took them, nest and all, to Terry in the cage. He was very curious about them, picked one out with difficulty, accidentally dropped it, breaking it. He sampled the contents, lost interest and went off to wipe his bill, having eaten nothing of it. Later it was inspected several times by Rhody, who, however, never touched nest or eggs. The nest and the four eggs are left where they were in order to check up on Rhody further.

A wanders away.

Archie was now more lively with the 3 young birds under his belt, and wandered off the premises again, 200 yards to the south-west toward the canyon.

R interested.

Rhody displayed considerable interest in this proceeding and followed but did not establish contact, although he once flew beyond him, perhaps 100 yards. In a few minutes he came back through the long grass, up hill, running and jumping. He passed by Archie without stopping and came back here via the Sorrells'. I believe he was actuated merely by curiosity and had no intention of getting into close touch with Archie.

A returned to cage.

Preparation of cage.

We brought Archie back to the cage. Terry began to display slightly as soon as he saw him in Julio's possession. Archie's wound was treated with bismuth formic iodide and vaseline cream. The lower portion of the former eagle cage was lined with burlap so that he could not injure his bill and a large sheet of celotex was placed so as to shut out all view of Terry. Before the latter was placed he could dimly see Terry, at times, through the burlap, and at once reacted miserably, but the celotex seems to have

[illegible] this award, for he resisted him.

Terry released.

In the meantime, before these arrangements had been completed, Terry was let out in the presence of Rhody (partly as a means of preventing a panic on the part of Archie in the adjoining cage and partly to observe reactions of Terry and Rhody).

Terry and Rhody

Terry, having no fearful experience behind him, sauntered out casually. Surely if Archie was not the attraction in the cage Terry must have been--Terry the almost-proven female and, today especially, the active nest builder and--also today--offered a mouse by Rhody with bowings and tail-waggings. This would settle the problem definitely.

Both indifferent at first.

But what happened? Terry, seeing Rhody a few feet away waiting and watching, immediately made a grand rush to catch a painted lady butterfly on the ground sunning itself, missed, darted after something on a plant outside the lath-house, got it, then looked for more victims. Rhody stared at all this, then wandered off to think it over. Terry, meanwhile, started to

R takes notice, but loses interest soon. Goes to magpies.

see the world as represented by the garden. Rhody decided to follow, made a couple of rushes at Terry with no more decisiveness than those that he makes at any other bird. Terry ducked once or twice, avoided the rushes, but did not run away and Rhody went to the small, temporary magpie cage to stare fixedly at those birds. To do this he had to go into the shop yard, away from Terry altogether. He has been visiting them there frequently ever since they were placed there. He does not flirt with them--just looks at them. They could not have been far from his thoughts if he lost

Terry wanders.

interest in Terry so easily. Terry worked off to the west, keeping inside the fence, behaving no differently toward me than when he

T good hunter

was in the cage, accepting worms, etc. He proved to be an active and successful hunter. Finally he wandered back toward the cage,

T and R indifferent.

where Rhody now was. At times they were not more than 3 or 4 feet apart, showing no particular interest, aside from one perfunctory approach by Rhody. There was no posturing by either bird and they might have been Archie and Terry before the recent upset.

I put T in cage.

I picked up Terry and carried him (I find it hard not to write her) into the cage as it was getting late and since Rhody did not seem prepared to take advantage of his opportunities (if such there were) there seemed to be no good reason for leaving Terry to face the night alone outside, unchaperoned.

Endless speculation suggests itself, but we seem to be just about where we started.

Brownie's brood leaves the nest.

Brownie sang more this morning than he has of late and it was noted that, for the first time, he carried his worms to the [illegible] and not to the nest. It looks again as if he and Nora were going to divide the family between them. Brownie's bird was seen--a lively stumbling youngster.

April 6th.

Terry let out again.

At about 7:30 A.M. I let Terry out of the cage. In the process he scrambled to my shoulder in order to get at Archie in the ad-

Tries to reach Archie.

joining section. He was determined to succeed, frightening Archie. I picked him up and put him out, but he came back in again after Archie. Rhody was outside with a huge branching twig, so I induced Terry to go out again. Rhody was not especially interested and went toward his nest, passing Terry. T marched toward the west, halting to quck, quck. (This appears to be an early stage of the coke, coke call and, at a distance, merges into it imperceptibly). He spent the next hour wandering about inside the west fence, always coming back to me to rest for a time and get food. I left

Another fright for Archie.

him there and returned to the cage to find that two little girls (one with a red sweater!) had been at the cage. Naturally Archie was paralyzed and hidden.

Rhody and Terry together and attack A

A released.

A leaves in fear.

About 9 A.M. Rhody and Terry came to the cage together, Terry at once making a strenuous effort to get at Archie, this time scraping his own bill on the wires from the outside causing the blood to flow. Rhody joined actively, throwing poor Archie into another panic. I decide to let him loose when the field was clear of the two other birds. This occurred soon. He ran and flew rapidly to the west. T and R seemed to be in amicable relationship. I went to observe Archie's progress. He went under the fence into the western lot. On my way back a whine from the bushes north of the house announced Terry, who followed back to the cage, entering it freely and making a thorough, detailed search inside for Archie. He did not know of course where Archie was. Rhody came and watched from the outside, then departed in the direction of his nest.

Terry returns voluntarily to cage. Searches for A there.

T calls for twigs. Gets one outside of cage and carries to nest.

Terry went to him and whined for some twigs. He was not obliged, so commenced shaking it. He came out, flew vertically to the roof of the cage (9 ft.) and wandered about there. He found a twig which Rhody had taken from my hand yesterday and abandoned there. He looked for places to put it, and also for a way to get into the cage from the roof. He finally came down with it saying coot, coot...... As he passed us in the doorway where I squatted. He climbed up my back and tickled the back of my neck with the twig, I thought he was going to build a nest on me! Finally he went directly to his nest in the cage and placed it carefully there--up to date the most definite indication, perhaps, of the seriousness of his nesting intentions. He called for more. I gave him the lining of the jays' nest (These jays are proving useful after all). I left him there working.

Terry in here.

I can make up numerous plausible combinations regarding the sexes of these birds. (Well I'll be hanged! Here is Terry under this table saying coot, coot. 10:20. I had nothing to do with it. 10:21, here's Rhody also. 10:25; T is back, pushing in the hall. Terry has never been anywhere near here before and, from the cage, it is a long, meandering route with trees and shrubbery and the rest of the house itself intervening). I shall have to drop the running theme of this paragraph, because of events. × × ×

Terry in living room.

Terry admires view from my shoulder.

12.30 P.M. Terry went into the living room and called. I went there at 10:30. He was sitting on the back of a chair placidly looking out of the bay window at the west end. (about feet from here). When I joined him he jumped to my shoulder and, for 15 minutes, sat there looking out of the window and occasionally cooing softly, very tame and gentle. We went out the front door at 10:55 to the lower garden. Rhody was seen 100 feet away waving his tail, with a lizard. He went to the cage, I followed.

Rhody courts T with lizard.

T here again.

Soon Terry came. Then began definite courtship, Rhody approaching T, T retreating. (Well, I'll be hanged again--a loud coo outside and Terry trots in. He spoils the continuity of my yarn--I left him in the cage--but I'll come to that if he gives me a chance. He is now crooing, cooting, etc. at my feet. I believe he is really attached to me and that, on both occasions, he trailed me. He is intoxicated with his liberty and the new world). To continue:

The courting.

...T retreating slowly and raising his tail, Rhody swinging into the air and landing just where Terry had been the moment before. They kept this up for several minutes, then Rhody went up to the observatory roof and Terry to his nest in the cage. After a half hour Rhody came down still with the lizard, Terry came out. There was a short repetition, then R went over the fence toward his nest, Terry back to his. Later, with T out and in, R's tactics seemed to be to induce T to come to the nest. T appeared willing, but

prevented by the fence , which, I suppose, he assumed to be a wall like the cage. (The fence is a wire one with triangular mesh). Since T knows all about climbing up on me, I went to the fence, although there are plenty of low points along it which R uses in going over.. T understood this and used me as a ladder, but did not go over as R was not in sight. He was in the nest. Noon. T then went into the cage and the next thing I knew he was in here.

1:45 He is still here or hereabout, making free of all household facilities. At lunch time in the cloister he would not go more than 25 feet from me, coming up on the table, etc. Later he went upstairs and out on to the roof of the one storied portion of the house. When I went up and leaned over the parapet of a porch to watch him, he came and lay down on my back.

I believe, now, that T is a female, with little doubt. The status of Archie is less certain--I do not know.

2:45 Terry has been in the inner cage (voluntarily) since 2 P.M. Rhody is, right now, investigating both the glass house in the lawn and the platform I prepared for him under Brownie's roof in the same tree. T has been calling ook, ook.....often and is restless. Rhody has, once or twice, been on the point of entering, but has changed his mind. (The entrance, since the alteration, is somewhat more confined than the one he knew).

There are women and children in the vicinity of nest 2-3 and I cherish the hope that Rhody will conclude that that location is untenable. At the moment it seems to be a contest of wills between R and T, each wanting his nest adopted.

Search for Archie over the area of the lot to the west failed to show any sign of him. He has not been seen since he entered the brush there. Food and water have been put out for him at a place where he is likely to go.

7:10 P.M. Another search about 5:30 did not locate him.

Rhody has shifted his roost back to the Sewalls' pine; he went up the tree at 6:34 (P.S.T.). Sunset 6:37. This is late for him.

Terry entered the cage again at 5 P.M. After 2 hours he showed no intention of coming out again, though Rhody solicited. Unusual for him--he spent all of his time inside the inner compartment, restlessly moving about. (Missing Archie, or trying to attract Rhody.). He was shut in for the night.

April 7th.

At 7 A.M. I went to the cage. Julio had already opened the door and Terry was out someplace. However, he saw me and whined, enabling me to locate him and, as it happened, Rhody also, who was with him. Their attitudes were purely platonic.

Terry, on invitation, jumped to my shoulder and rode around with me for a short time. Both he and Rhody then turned their backs and T retired to the cage where he chuck-chucked and crooned. (Trying to get Rhody to go in.).

Meanwhile the wren-titmouse feud which has been of long standing here, broke out in the lath house nearby, over the wren's house. Rhody went in to "arbitrate", but soon gave up.

At 7:30, when I left, the situation was: Terry in cage; Rhody outside; the feud continuing actively with four birds engaged.

9:00. Rhody spent the time from 7:30 to 8:30 on the observatory roof. He then flew down to my feet, thence to the cage, in which Terry had remained all the time, in the inner compartment, moving about restlessly and occasionally making one or another of his calls. Rhody displayed a little at various places for T's benefit, but would not go into the cage. The most T would do was to come out into the new extension for a few seconds and then

retreat, honking once or twice. He is unable to interpret his own instincts and can not fix upon any specific course of action. Whenever I approach anywhere near, he cries, but usually stops when I go to him. It is then found that there is nothing I can do that satisfies him for more than a few seconds; he is off again from perch to perch still in the inner compartment, although he is free to go any place inside or outside the structure.

Rhody is now at work again on nest 2-36. Terry calls puck.... as if to call him, but he has his owns ideas as to the proper place to nest.

Julio feels keenly Archie's absence and searches for him whenever his duties will permit. Thus he was looking for him between 6 and 7 this morning and several times yesterday. He is intensely attached to Archie, Terry, Rhody and Brownie especially. With him, as with myself, it is more the manner of A's departure and the surrounding circumstances, that are cause for regret, rather than his being away. Archie left precipitately and in fear of everything in this environment: kin, friends of the human race and his home for the last 9 months, all alike were no longer bearable after Terry touched the trigger.

At 10:07, as I approached the cage, there were two roadrunners in it moving about quietly; they were Rhody and Terry. Shortly there was a commotion in the upper extension in the acacia branches and Terry came running out with "nose" bloody. He went to the gravel bin, sat on top, took worms offered and permitted me, somewhat reluctantly, to dust his wound with BFI (Bismuth formic iodid)

To tests Rhody's state of mind I went to the wire and offered him worms from the outside. He accepted them readily.

Terry meanwhile disappeared. At 10:27 he was found in the orchard, Rhody 50 feet away apparently looking for him, but not energeticlly. T wandered off to the street, followed Selborne Drive to the Robinsons' on Estates Drive, not frightened. Curiously, passing automobiles disturbed him little. I sat on the opposite curb watching him. He turned and crossed the street to me. I picked him up and brought him home, putting him in the cage, leaving the door open. He went to the nest and began to cry, taking material offered him and placing it. (Note finished 10:55).

11:07. Rhody in the cage at 10:58, Terry not to be found. R does not seem to know where T is.

12:38. I located Terry at 11:18 "by ear". I could not see him, but he cried (mewed, whined, [illegible]) revealing his location. He is off now 250 to 300 yards to the east in the Reynolds--Robinson-Covell territory on the edge of Dimond Canyon. He is not frightened and I could have picked him up a dozen times. Once, in the Robinson place, he was chased by 5 or 6 small black dogs (kind unknown to me). He easily eluded them and made a grand flight through the air out to an open field. Rhody found him there, but when T pursued his course farther to the east, did not follow. Julio tells me R was in the cage again looking for him during my absence. He was finding plenty of flies and other insects, catching them expertly.

2:00 P.M. Rhody is resting peacefully in nest 2-36. He has been there for nearly an hour. Neither of the young birds about.

At 1 P.M. Rhody was again in the cage, in the inner compartment; I suppose looking for Terry. He spent much time in looking around inside. When he wanted to come out he showed some signs of confusion, trying everything but the open door, but still carrying the mouse I had given him when I found him there. He was still at a loss when in the new extension, but at last found the door. He then carried the mouse about with the usual display, but was never more than 100 feet from the cage, doubtless not realizing

fully that the young birds upon whom he has been basing his plans are gone. Or, possibly, relying upon his ability to get one of them to return. I wonder what next.

After some hours absence I returned at 5:45 to find Rhody again in the inner compartment of the cage searching, searching. Julio said he had been there about an hour. He came outin a few minutes and continued what appeared to be his search, walking a few feet (5 or 6) stopping to look and listen. He examined the territory in the vicinity of his nest, as if expecting to find the missing birds. He again returned to the cage for perhaps a minute, then off to the west to drink. He then started toward his roost, paused changed his mind and ran hastily (about 100ft.) back into the cage.

There his attention was centered upon the magpies, who have been returned to their old quarters, as if the thought had suddenly occured to him that the solution of his perplexities lay there. He tried to get at them, rattling his beak, for several minutes, then came out again headed for his roost. When he had reached the same point at which he turned back before (6:03 P.M.) he halted abruptly and stood absolutely without motion. I went to him and crouched 3 feet from him. He did not move anything but his eyes and lids. I tossed worms to him; still he did not move. Brownie appeared and picked the worms out from almost "under his nose" with no effect other than to cause him to roll his eyes downward slightly without moving his head. He remained thus until 6:18, when I stretched out a hand to touch him. He moved off 2 feet, but kept his head pointed in the same direction. Brownie came, stood on one leg and watched us. Julio came, still no effect upon R. He would not even look at worms tossed him. At 6:25 he stirred slightly and moved down the bank to the orchard. I then left.

While this may not have any connection with the confused state of his mind due to the sudden and radical alteration of the conditions within the cage which he had been used to for months, it is perfectly evident by his actions that he simply can not convince himself that Archie and Terry are no longer in the cage, or, if not there, somewhere near. Yet he saw Terry over by Robinson's this morning and joined him. He also saw Terry leave there and go with me towards Reynolds'. He either can not readjust himself quickly to the new state of affairs, or else, as suggested above, relies upon his ability to get him to return.

Neither Archie nor Terry has returned. I expect Rhody to abandon 2-36 if neither does and probably begin his coo, coo... call once more. It seems certain that he had counted upon one of them as a mate and had based building operations--especially choice of locations--upon that expectation. His repeated inspection of a third possible site in the dorm, still nearer the cage than either of the others seems to point to growing certainty on his part that a mate had been found. Cessation of wide hunting and cooing points in the same direction.

Julio is now grieving over Terry and sought assurance from me that T is happy and did not leave through fear. As I had told him of his leaving the cage abruptly as a result of his and Rhody's flurry inside, with a cut bill, he feared that the case was a parallel of Archie's. I explained that T's hurt was slight and that if he had been frightened badly he would not have permitted me to go to him in the open and powder his wound with Bfi, even without holding him and that all the time I was with him he was friendly and happy and having a good time catching insects and seeing the many new and strange things, getting worms from me now and then. Further that I could have picked him up any time

I wished and brought him back. In fact did it once, put him in the open cage and he went to work on his nest. I explained further, that, while I did not like to let him go and miss him badly, I want him to be happy, and if being free is what he wants, then that is what I want for him, notwithstanding that I know danger confronts him. The same, I said, applies to Archie, though I regretted that he should have left in fear.

April 8th.

Rhody at cage, refuses worms. At 7:30 A.M. Rhody was standing by the cage staring at it quietly. Though tame and friendly, he would not take worms dropped at his feet.

No A and T. No greetings came to me from the cage, only the sound of wild flutterings of a brown towhee and a golden-crowned sparrow that had wandered into it.

Rhody in street, wants worms. At 8:20 Rhody was out in the street looking and listening. He trotted to me, this time glad to have worms. He then rattle-booed sonorously, went to the cage for another look, then carried twigs to nest 2--36.

Goes to work. He has not yet adjusted himself to the changed conditions. He should be searching farther afield.

R shifts interest to magpies. On going to the cage at 10:45 I found Rhody inside searching. He came out only to return in a few minutes, turning his attention to the magpies. It seems that his hopes at present are centered in these birds.

R in cage again. The cage was again visited at 11:50. Rhody soon came running past me, entered the cage, went up into the upper part and all through the thick foliage of the acacia branch there. Finding nothing, he came out, stopped, went back to watch the magpies. He wanted no food of any kind.

Terry at Reynolds' About 4:30 P.M. Mrs. Reynolds phoned that one of the roadrunners was at their place. I knew it was not Rhody as he was here. I went over to see the bird but he had moved on into one of the other gardens and could not be found amongst the shrubbery. It was undoubtedly Terry. ([illegible])

On returning here about 5 Rhody was in the cage again. At 6:15 he was still there when I left. In the meantime he had been in and out of the cage perhaps a dozen times, practicing his new stunt, which appears to be based largely on the magpies, though it is also combined with a search of the inner compartment and extended periods of reflection there.

See 1157 A

The magpie portion depends upon use of a certain shelf inside the 12 by 12 extension but against the wire netting of the magpie cage. This shelf is about 1 foot square and has a back of similar dimensions which is against the wire. Rhody sits on this shelf facing the back and crouches low. He can not see the birds on account of the back, but he waits patiently and when he hears one of them on a perch close to the wire, suddenly thrusts his head around the edge of the back and aims a "pulled" peck at them. The fact that he pulls his peck shows that he knows that he can not reach them through the wire. When he gets tired of this he leaves the cage and starts off in the direction of his night roost, but may be back again, running and flying, in anywhere from 10 seconds to 5 minutes. It looks as if he varied the time in order to take the magpies unaware. The magpies are not much excited by it but occasionally oblige by fluttering and comment. I do not know whether Rhody does this for fun or because of some mating

instinct that demands exercise, now that A and T are no longer available.

No singing by R.

I am somewhat surprised that he has not called A and T, but he is silent except for a rare rattle-boo, an occasional hroo or a soft rattling of the beak when playing with the magpies.

Brownie and family.

Brownie and Nova have divided the family of two between them. Nova is scarcely seen, but B, though less insistent now that he has but one youngster to look out for, still counts on me. He keeps his charge in the glade and it is just beginning to follow Brownie when he comes to me, showing how easily it could be tamed.

April 9th.

I look for Terry, but find Archie.

Archie friendly.

At 7:15 A.M. Rhody was sunning outside the cage. I went over to the Reynolds' to see if I could find Terry. A roadrunner was seen immediately when I entered the driveway, sunning itself. On first seeing me it started, recovered, and immediately ran to me confidently and began to eat worms out of the box which I offered. It was Archie, not Terry as I had expected. Archie was as tame as ever and began to sun himself by my knee when he thought all the worms were gone. Later he went up and walked along the wall, but came down and sat on my knee when I showed him that ~~that~~ there were more worms. When he had had all there were, he continued to sit there sunning himself and did not object to my enclosing him in my hands. But when I grasped him firmly, objected.

I bring him back. put in cage.

R chases him out and away.

I brought him back (about 8 A.M.) and put him in the open cage, where he immediately began smoothing out his feathers peacefully.

Rhody soon discovered that he was right, after all, in his belief that it was worth while examining the cage at frequent intervals and went in. There was a lot of rustling in the acacia bow and Archie dropped to the lower portion of the cage, booing.

He came out the door, not hastily. Rhody followed a minute or so later, darted at Archie and both ran with tremendous speed down the back road to the west, then took to the air and disappeared in the heavy growth. R was overhauling A quickly.

9:37 Rhody is now watching from the top of the Scamell house, silently.

About 9:05 I went to the west fence. In a half minute I saw Rhody in the street beyond the west lot running toward it. I thought I saw Archie on the far edge of the lot in the scattered baccharis, but may be mistaken. I saw Rhody when he arrived there. He then went up in a small oak. I went out and stood 25 feet from him, but separated by a dense baccharis thicket. R was booing repeatedly. He worked over to my side of the tree 15 feet from me and, to my surprise, launched himself through the air at my head, over the bushes, as if to land on me. As I was about to dodge, he banked abruptly (I could feel the wind on my face) and landed 6 feet behind me. He wanted worms. From there he went to the Scamell house. (Time, now, 9:45).

Archie a male?

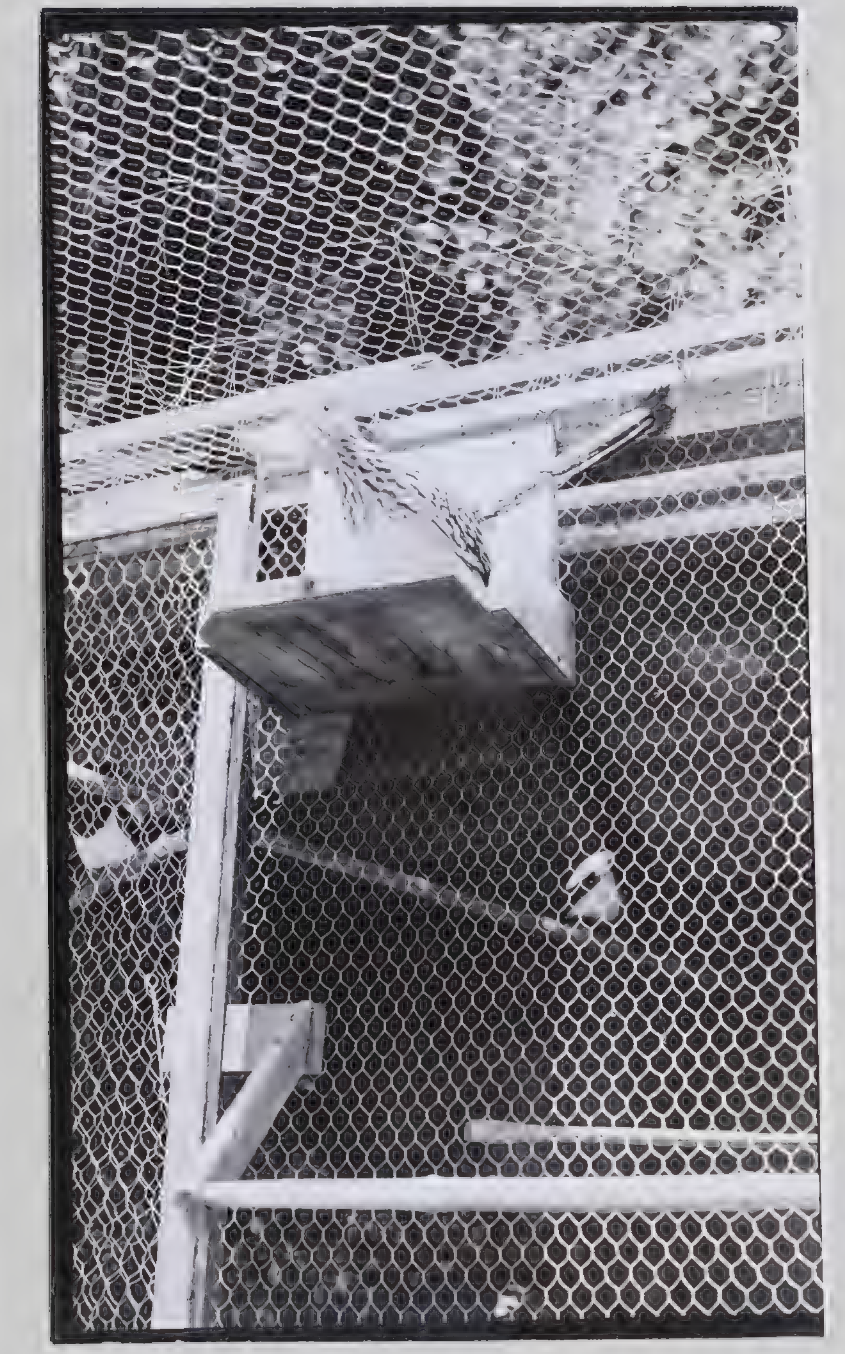
Going back to his chase of Archie: It will be noted that the performance radically differs from the Rhody--Terry one, and is ~~more~~ consistent with the thought that Rhody was chasing a male rival from his territory.

10:25. At 9:45 Rhody was found inside the cage on the shelf "doing" the motionless part of his magpie act. (This shelf, described yesterday, is like a legless, straight-backed arm-chair in form). He came out at 10:23 after spending most of the time in the inner compartment (Cage B, sketch p.1003) apparently trying to find a way out, although he should know all about the exit

See p 1157 A

This is Rhody on the "arm-chair" shelf, inside the 12 x 12 foot outer compartment of the cage and against the netting of the magpie compartment. If the road-runner maintained the pose shown in the picture long enough, the magpies (dimly seen in the back-ground) would get hold of the tip of his tail. As a rule they pay no attention to his evolutions.

Rhody's attention has just been attracted by something off in the distance.



This shows the
"arm-chair" shelf

by this time. He found it several times, but as with the mirror, just at that moment was attracted by the magpies, so had to turn his attention to them, losing bearings in the meantime. This necessitated his rediscovering it on a subsequent tour.

Sense of direction. So far I have observed nothing in connection with any of the birds at this place that would indicate that they have any "sense of direction" superior to that of man.

R in cage. Absent until 4 P.M., at which time Rhody was found in the cage teasing the magpies.

April 10th.

Ditto. At 7 A.M. he was doing the same thing.

No A and T. From 7:15 to 7:45 search was made for the young birds without results.

R in glass house. At 7:45 Rhody was inspecting the interior of the glass house in the dorm.

I made another round of possible places that A and T might favor, again without results.

At 9:50 Rhody was again in the cage, not seeming to be worrying about the absence of the youngsters especially. He was very much at home, preening, resting and having occasional bouts with the magpies, sampling the food, etc. He came out after 25 minutes and wandered over to me to look into the worm situation. After this he loafed for a while, then went up to study the glass house again. Clearly this structure is on his mind as a possible nesting place.

About 11:30 I was up at the glass house (which is entirely surrounded by foliage of the tree, removing a few twigs in an effort to improve it for Rhody. Happening to look down down at the ground, I saw Rhody with a large mouth ful of weed stalks, looking up at me like a dog. This weed has gray-green, velvety leaves and stalks, and when dried, as this was, would make good lining. It was not, therefore, suitable as starting material for a nest and I was curious to see what would happen. After ap-pearig to consider the matter, Rhody trotted off and carried it to his 2--36.

Last year he started four nests, finishing only the last: the birthplace of A and T. He had a mate from the placing of the first twig in the first nest.

This year he has no known mate and has started two nests, but plainly has the possibility of a third in mind, though still working on the second.

The evidence is not sufficient to show, assuming Rhody to be a typical male roadrunner (not necessarily a warrantable assumption) whether cock birds build these nests as decoys for a mate, as "cock nests" or as actual brood-rearing places built in the knowledge or the belief that the bird has a mate, actually. The only difference between the two years' performances to date appears to be that, last year, he actually had a mate (though I think with some uncertainty on his part as to the definiteness of her acceptance of him and his structures until the last) whereas, this year he appears to have no mate, but gives every evidence of having considered A or T (presumably T) as a distinct probability. Perhaps he still does, and really knows where to find T. (Note finished at 12: o5).

After writing the foregoing note I went to the cage, finding R there as expected flirting with the magpies. He came out soon and went to the roof of the observatory, thence to the highest chimney of the house, where he sat until 1:05 (About an hour). He kept his bill open, as it is a rather warm day, although, up there,

the breeze ruffled his feathers.

At 1:10 he left for the cage; besdies attending to the magpies he rested in the inner compartment as if liking the surroundings.

Test to determine if R would offer mouse to mags.

Did not, but offered to own reflection.

This seemed a good opportunity to determine if he would give his mouse display for the benefit of the magpies, now that he is so fascinated with them, thus giving perhaps, some indication whether he differentiates between them and other birds (I.e. roadrunners, I mean) as mating prospects. Accordingly I gave him a live mouse while he was still in the cage near the magpies. He immediately began his mouse-display with vocal accompaniment, but not for the magpies, as he turned away from them and performed at various points inside the inner cage. When he came out he had to pass the magpies. (Compare previous notes of the last few days, where it is shown that he has been "uhable"to get out of the cage at first trial, due to the distraction of the magpies). This,then would be the interest moment. However, he went right by them without a pause, came past me, went to the mirror outside (which, as these notes show, he has studiously ignored when courting A and T) and offered the mouse with the usual courting byplay to his own reflection. You see? He wanted a roadrunner to whom to give it; that is what it looked like. I do not guarantee the interpretation of the act.

A new nest site?

"Cries" with mouse in bill; another "first".

Parallel behavior of A & T.

For 30 minutes more he carried the mouse about, never more than 25 yards from the cage, repeating his act to nothing in particular, then took it to 2--36. During this interval, however, he had twice taken it up to a good looking nest site in a tree nearby which he has several times considered as a possibility. Each time I approached him while he was quietly sitting there, he whined plaintively at me with the mouse still in his bill. He has never done this before when carrying anything. As pointed out more than once previously, he has never been heard to "cry" thus for any bird, or forthat matter, any creature other than myself. (The parallel use of the whine by A and T differs only in that they whined also for men they knew,and T about twice to Archie. But in the latter case, the whines were merely continuations of those first directed at me and then switched to A on his sudden arrival). (Note finished at 2:13).

Strategy of game with magpies.

I did not see him at the cage again until about 5 P.M. when he had a long game with the magpies. When the time approached for him to go to his roost he altered his strategy to that described yesterday for the same hour of the day, i.e. he would ostensibly depart for his roost, come back in a hurry, etc.

April 11th.

R greets me before I see him.

As I approached the cage at 7:05 A.M., Rhody not visible, a faint whine sounded nearby and I thought one of the youngsters was calling, but it proved to be Rhody, sunning on the ground 6 feet away. It is singular that his whine should be so much more feeble than those of the young birds.

R starts third nest of the yesr

After a round about the tract looking for A and T, without finding them, I returned to the cage at 7:40. No Rhody. It occurred to me to look in the tree where he took the mouse yesterday and whined at me, and, sure enough, Rhody was hard at work on nest 3--36, up and down, down and up. Maybe No. 4 will be it !

The rest of the day was occupied in work on No.3, playing with magpies, surveying the landscape from the chimney top, resting in the cage and in 3--36, etc.

Brownie and Nova start second nest

Brownie and Nova have started their second nest of the year; this is No.14 for B. They are stillfeeding the first brood.

April 12th.

B and R at work at 7 A.M.

Brownie and Rhody were working on their nests at 7 A.M.

Rhody continued his attentions to the magpies and still has not begun to call again for a mate. Nearly all of his time is spent about the place now. I am expecting him to begin calling any time.

Archie or Terry seen in E. Oakland?

Nothing has been seen of Archie and Terry since last noted here but Walter Moore told me today that his friend, Sturgeon saw a roadrunner in his backyard and tried to catch it He lives in the vicinity of School St. and Coolidge St.?

April 13th.

Left too early in the morning to check up on the birds. Returned about 2:30, at which time Rhody was in the cage intent upon the magpies. He went up into a tree near the one containing 3 -36 and, on coming down, came to me when I spoke to him and took worms from hand. Next he picked up a twig, seemed to hesitate uncertainly and carried it up into No. 2 instead of No.3! Now what does this mean? He had never been seen to return to a nest after once leaving it and starting another.

Rhody goes to work on 2nd. nest instead of 3rd.

Courts his reflection again.

After a short time he reappeared on top of the cage, but, on seeing me carrying a live mouse by the tail, came down for it promptly. After killing it he ran directly to the mirror, after pausing behind me to bow, hroo and wag his tail as if in thanks. He held the mouse directly against his image in the mirror a moment while wagging, etc., then went toward nest 3, went up the tree, "thought" for a time, made up his mind to go over the fence toward 2-36. For a half hour, during which he moved only about 10 feet in three moves, he stood on the hillside quietly, looking and listening. Two or three times he performed his act, thencarried the mouse, also, up to 2-36. Julio says that, at such times as he saw him working earlier in the day, it was at 3-36. Now what?

Now takes mouse to 2-36.

??

B's nest.

Brownie's nest from the outside, looks completed. The second nests of the season, if my recollections are not at fault, are always more quickly constructed than the first.

April 14th.

Two Hours and Twenty Minutes of Rhody.

11:25 A.M., weather dull , no shadows being cast.

R away from home with twig.

Up to 9 A.M. nothing had been seen of this creature, but at that time I found him sitting on the bank of the S.W. corner of the lot to the west, 200 yards or more from the cage, with a twig in his bill, looking off to the south.

R and snake.

On the way I had noted a small gopher snake with head crushed by some vehicle, in the street. I went back and got it. It measured two of my spans in length. (Without forcing, my span is somewhat over 9 inches). The snake was still fresh and limp.

I carried it to Rhody, who dropped his twig and came down the bank to get it at 9:05. (The following times are to the nearest minute).

He began at onceto "kill" it . When this operation was completed to his satisfaction, he desisted and hrooed once with a deep, humming sound, but did not show any evidence of intending it for a love-offering.

First song for weeks.

At 9:19 he bowed his head and uttered the sound I have been waiting for: the first coo-song for many weeks, but it would not

have carried far. Still there was no tail wagging.

At 9:20 he sang again, and

at 9:21 began to wag his tail, right and left face, about face, croo and bow; so it was intended as a lure. At the same time he began to move about 3 to 6 feet at a time.

At 9:38 I went for the movie camera, although the light conditions, especially on account of the heavy undergrowth, were unfavorable, returning at 9:45. (This time interval gives some idea of distances).

Photographic attempts.

Until 10:45 I kept in touch with him, getting several unsatisfactory shots of his action, due to conditions, I could not use a tripod. Diaphragms varied from F2.8 to F5.6.distances 8 to 15 feet. He did not seek to avoid me, but regulated his movements on his own initiative. Up to 11:45 he had, at no time, gone more than 50 feet from the point where he was first seen. At 10:45 he came down the bank and started up the sidewalk as if headed for home. A passing truck accelerated his movements and he disappeared in my "chaparral" covered bank. Until 11:20 I looked for him without success in the most likely places. On my way to nest 2-36 I passed nest 1-36. To my surprise, there was the old rascal's tail sticking up out of it --the first time he has been seen there since he commenced No. 2 of this year. I had not the slightest notion that he would be there, and looked up at it merely to be sure that I had overlooked no possibility, however remote it might be. He stuck his head over the edge and whined at me, but no snake was in his bill. Perhaps it was in the nest. (End of this note).

hody rests in nest 1-36!

Still in 1-36

12:15. Rhody is still in the nest; his tail is now horizontal, supported by the rim. Perhaps he ate the snake and 1-36 was selected as the mostconvenient place in which to lie quietly and let nature take its course.

but works on 2.

When next seen he was going to work on nest 2-36.

Rhody, magpies and mouse. A test.

At 5 P.M. Rhody was intently watching the magpies from his perch outside the magpie cage, but inside the main cage. As a further test of his possible view point as regards these birds, I went in to him and handed him a very small, live mouse, thinking that if he took it while so keenly concerned with these birds, who were only about 2 feet from him and at the same level, he might display for them, if he considered either of them as possible mates. The small size of the mouse was determined upon on the theory that he would be able to kill it in one squeeze without any need of his going down to the ground to hammer it there. It worked out all right. Rhody took it without shifting his position, looked for a moment or two at the 'pies, seemed to think, then dropped to the ground and began at once his regular performance, facing away from them and walking off to the inner cage, where he continued his performance, but only for a short time.

Drinks with mouse in bill.

A curious feature was introduced here. He looked down at the water in the pool with the mouse still in his bill, hesitated, then shifted to the opposite side and attempted to drink without dropping the mouse. In the process the mouse was dipped beneath the surface and Rhody made swallowing movements while his bill was immersed.and the mouse still in his bill. The effort did not appear to be successful and was abandoned. He walked past the magpie ate the mouse and then returned to continue his watch of them with occasional short jabs at the wire when he thought they were within reach. It would seem from all this that he has no mouse-associatin in his relations with the magpies and his interest in them is not as prospective mates.

Interest in magpies purely platonic?

April 15th.

Rhody's second anniversary.

On this date, two years ago, Rhody was first seen at this place.

and magpies.

Nest 2-36 the favorite.

About 9:20 A.M. Rhody was given a mouse. He did not show it to the magpies, but as on previous occasions since the departure of A and T, he showed it to his image in the mirror. He then took it to nest 2-36. Later in the afternoon he was given another mouse while in the cage. He went to the inner cage and displayed there, then again took it to nest 2-36.

To date then, it looks as if the magpies are not considered as possible mates.

Also it would appear that nest 2-36 is still favored above the others. He continued to work on it and rested perhaps 2 hours in it also.

R puts one twig in glass house.

Curiously, however, he also took one twig up into the glass house and placed it there. Perhaps this will be No. 4?

Speculation on nesting.

Rhody is doing no calling and apparently little searching. He does not seem to be bothered about anything, but something, certainly is impelling him irresistibly to build nests, though he really works little.

His first year here was mateless and nestless, though he called frequently in season. His second saw four started, the fourth being completed, a mate secured with the first and a brood reared in the fourth.

Query? Does he really know anything at all about what he is doing this year, or are his nesting activities merely spurred on by instinct?

The two years (3 nesting seasons) do not match up at all. Perhaps he knows where Terry is and is preparing to bring her (?) back. Perhaps he knows where there is a female and counts on her.

What is the object of all of these nests?

I thought last year that he built several because his mate (whom he had at the beginning of the first one) was too shy to brook the presence of human beings at relatively close quarters; hence the succession of nests farther and farther away from here. On the other hand, he may not have truly won her until the last and was forced to build where he was certain of finding her.

This year there does not appear to be any timid mate to influence his choice of site and, curiously, the nests have been successively nearer and nearer the cage. If he should build a fourth in the glass house it would be still nearer. He, at any rate, does not object to human presence. (There was a circular saw driven by a gas engine working all day about 100 feet from nest 2-36, which he did not appear to mind).

Possibly his strategy is to build a lot of nests on the chance that one will be a winner, or:

Some of them may be decoys to protect the really serious effort, which comes later.

At 5:25 Rhody began his late afternoon type of game with the magpies. By 5:35, when I left him gazing prayerfully at them, he had been in and out 6 or 8 times, each time turning back at a different distance from the cage, varying from just outside the door to 50 feet.

Rhody in "soft" moult.

During the last week I have noticed that, when Rhody scratches, three or four feathers are dislodged from body, neck or head, and that feathers from those portions are being found more frequently about his haunts.

April 16th.

Rhody, in 1-36, suddenly works on seeing me.

Rhody was not seen at any of his nests this morning until 11:45, when he was sitting placidly in 1-36, crying on my approach and making a sudden show of activity in rearranging things within the nest, as if to make me think that he was working all the time and not loafing, as he clearly was.

This is like Brownie's bluff.

This curious behavior, while probably not interpretable correctly in those terms, resembles exactly the same trait pointed out in Brownie in the earlier stages of these notes. It must have some significance.

Takes mouse to 2-36.

When given a mouse later in the day, he went through the usual procedure (ignoring his magpie friends) and took it to nest 2-36.

April 17th.

Thrashers lining their No.14.

The thrashers are lining their nest, working, it seems, only in the early forenoon.

Still feeding young.

The two youngsters of the first brood of the year are still being fed by their parents, but are doing considerable foraging for themselves. There has been no evidence of their parents' intentions to drive then away as yet.

R's luxurious life.

Rhody is certainly living a life of luxurious ease, with no apparent cares. He works occasionally on nest 2-36, rests in it an hour or so at a time, lies on the ground near the cage for indefinite stretches, plays with the magpies, etc.

This morning about 9 he went off to the north-east casually, presumably in search of a mate, but he was not very strenuous about it. Except for the two "songs" when he had the snake the other day, there has been no vocal evidence of his trying to attract a mate.

Ignores mags, takes mouse to mirror.

Then to 2-36. Mate-seeking degenerating.

He was given another live mouse today while he was watching the magpies, but ignored them and went directly to the mirror, which is not in sight from his magpie-watching place, and which he has to reach by a round-about course, the mirror not being in sight until his nearly circular approach to it is completed. This mouse, also, he took to nest 2-36 instead of wandering for several hundred yards and mounting high points to call and look off over the country. Plainly his efforts to find a mate have greatly degenerated.

April 18th.

Rhody near wrentit nest.

At 8:30 A.M. Rhody was a few feet from the wrentit's nest (which contains three chicks about ready to leave)+ much to the parents' annoyance; but he disregarded them entirely, gathered slender twigs and carried them to nest 2-36, uphill, perhaps 60 yards away--a totally unnecessarily long carriage.

Rhody and wild mouse

Ignores mags.

Takes to 2-36.

At 9:04, Rhody in the cage watching the magpies, was offered a live mouse outside. This was a lively, wild one which was released (in order to make him chase it) at the far side of the cage away from the mirror. To catch it, he had to run west, directly away from cage and mirror. On killing it he began his display, ignored the magpies, ran to and around the cage to the mirror, showed it to himself, then after the usual performance at various points, carried it to nest 2-36 at 9:15.

So far, the display at the mirror has always been short, i.e. with the mouse--a matter of a few seconds only. It is as if this action were an essential portion of the ritual and he knows that it will be unproductive of response.

+ There were four.

R repeats work-bluff.

R moulting.

New feathers.

I found him still in his nest about 11, having probably been there ever since. He whined and made a few perfunctory efforts to arrange things inside when he saw me. In a few minutes he was preening on top of the cage, soft feathers floating away. I went and stood almost directly below him--near enough so that I could easily have touched him. In addition to the feathers, it was noted that he was also removing flakes of the sheathes which enclose new feathers, so presumably new feathers are coming in.

Takes twig to glass house,

then to mirror.

After this he retired to rest on the ground in partial shade until about 11:40, when he began to look about for something ~~to~~ interesting. This proved to be a short, thick twig which happened to be lying in his path. This he took up into the glass house, looked for a place to put it, decided against action there, came down, trotted past my feet directly to the mirror, where he pressed it for an instant against the glass, as if reporting to some tally-man or time-keeper, thence to nest 2-36.

Brownie singing to "hold" Nova.

For the last week or so Brownie has sung more--not long songs--but short snatches of full song, the apparent object being to "hold" Nova.

Youngsters follow B to me--an inference.

Chicks differ.

Brownie discriminates against N's chick.

This morning both young birds, for the first time, followed him to me, suggesting that Nova is relaxing her care of her special charge, possibly in anticipation of egg laying in the new nest. It was quite evident that "her" chick is smaller and weaker than B's and not in such good condition, the difference perhaps being due to B's frequent use of me as a food provider. Brownie very clearly discriminated against the smaller bird in feeding--though he did feed it--even to the extent of passing by it with worms for the larger one, who had already been stuffed and had retreated 50 feet or so into the bushes and needed no more food. (See later)

Rhody still-hunts lizard.

See p 1164A
also [illegible]

At 1:58, Rhody, prospecting about in the upper part of the inner cage, spotted a lizard sunning itself on a rock forming a part of my Upper Sonoran "scenery" in the 12' x 12 new extension. He immediately ran to the rock and, the lizard having disappeared, crouched low ready for action, absolutely unmoving, staring at the spot where the lizard disappeared. (This lizard took to my scenery several days ago, and hides under a certain rock).

2:05. First movement by Rhody, and then only his head to snap at a yellow-jacket that buzzed by him.

2:08. Too hot on the rock, so has to open his bill and puff. No other movement.

2:11 He suddenly strikes at something through a chamise bush (Adenostoma fasciculatum), misses and very cautiously peeks behind and under the rock until:

2:13, when he gives up, goes to look at the magpies, gets meat and at:

2:15, comes out of cage to cool off in the breeze that blows over the ridge after prolonged bill-wiping characteristic of these birds after eating anything moist or sticky.

I went into the cage.

2:20. R comes in again, goes directly to same rock and resumes tense vigil. He looks very green. The ~~mouse~~ lizard had not shown up again, so Rhody remembered the right spot precisely for at least 9 minutes. (Intelligence).

2:26. To inner cage after a dash at the magpies.

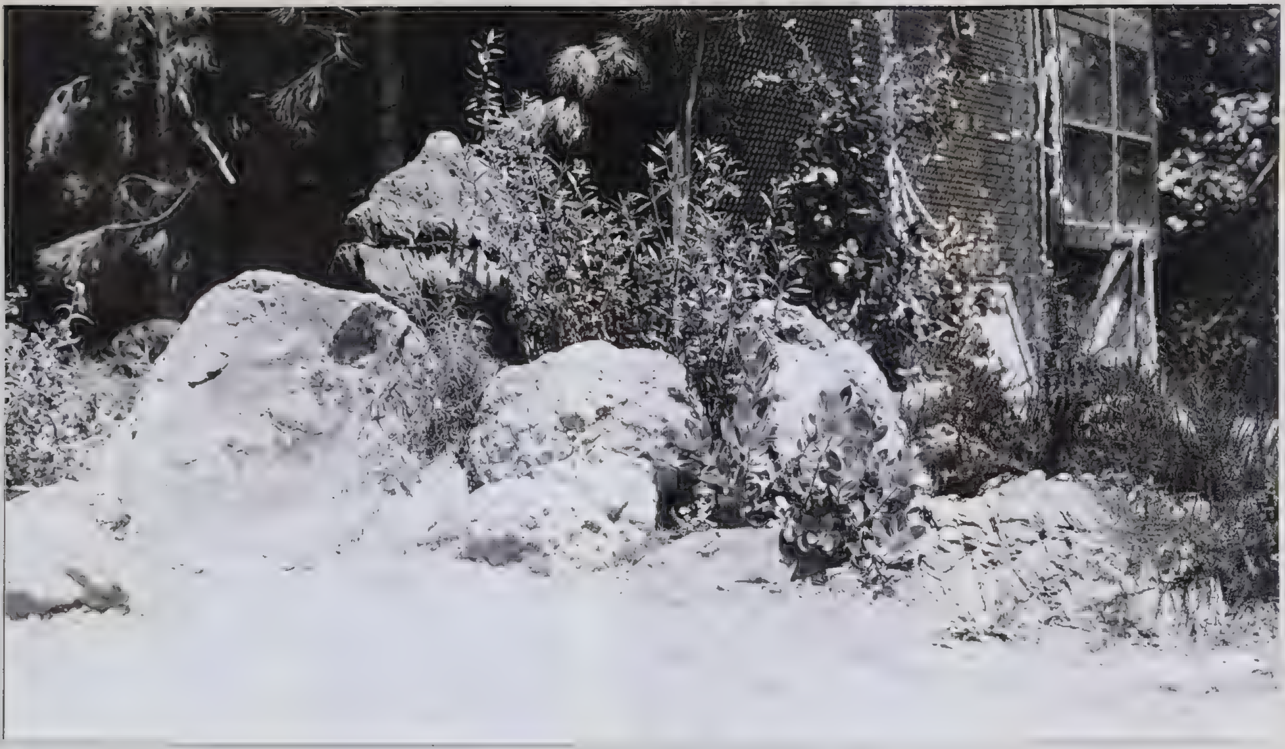
2:27 Drinks long. (To 2:28¼).

2:29 Back for lizard again, making slow search.

2:31 Goes to inner cage to get shade.

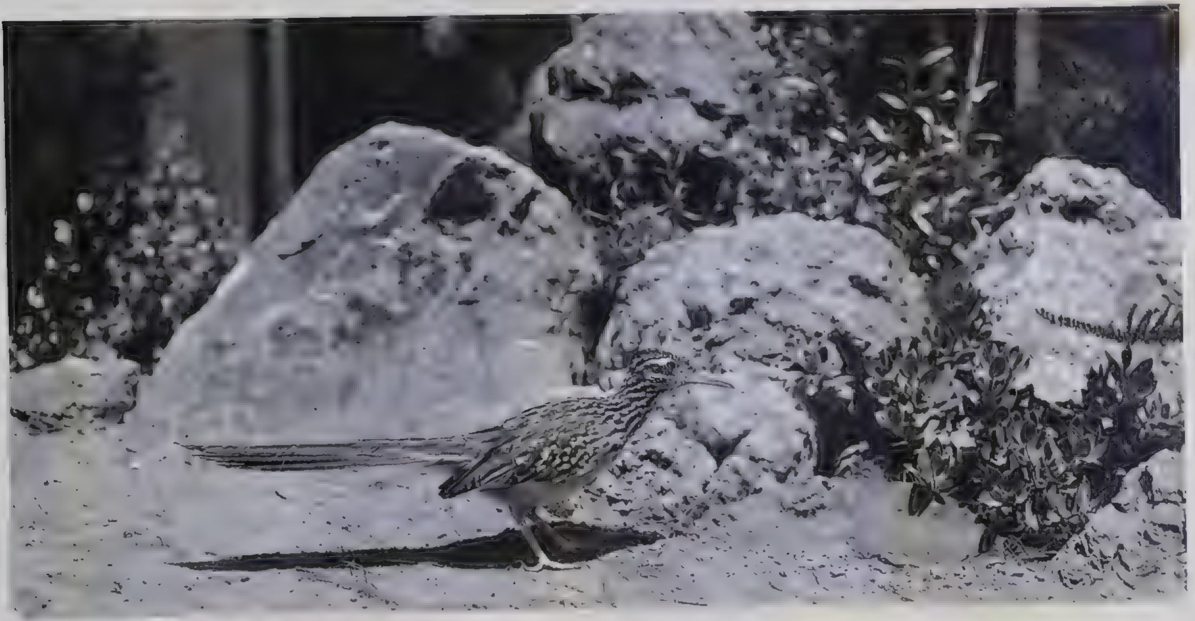
Makes quick time to 2-36.

2:40 Comes out rapidly carrying a twig and makes the fastest time I have yet seen him make on the way to nest 2-36.



"Upper Sonoran Scenery" in 9 x 12 extension of the cage.

(Chamise, Manzanita, Monkey flower--Mimulus or now Diplacus--
Live oak, Pentstemon, Coyote brush--Baccharis, Old-man--Artemisia).



Rhody wondering where the lizard went, but not interested enough to follow.

1164-B.

R's memory. Remembers lizard place for 3 hour

Mouse and mirror.

A little before 5 (I had been engaged elswhere since last note) Rhody was again on the watch for the lizard. I gave him a live mouse. As usual, he ignored the magpies and went to the mirror with it. After a 5 or 10 minute rest, back to the mirror for a rather extensive display.

Mouse to 1-36

At 5:20, after wandering about aimlessly, he carried it to nest 1-36 , coming down about 6 without it, heading for his night roost in the Scamell pine.

Brownie, the second time, does not discriminate against other bird.

Some hours after Brownie was observed with the two youngsters, he was again followed to me by them. This time he fed then fairly impartially. This suggests that Nova is leaving the job to him and may be away.

April 19th.

I move mirror. hody. with mouse emembers where it should have been.

Rhody was not seen often during the forenoon, although he was out in the street at 7:15 A.M. About 11 he came to the cage, got a mouse from me and began his regular ritual, including running to "show it to himself" in the mirror. However I had shifted the mirror about 10 feet, so he ran directly to the exact spot where it had been and made his display as usual, after some hesitation, facing the spot. This may not have any particular significance, other than indicating ability to remember where it had been, because, on this occasion he had, for the first time, displayed for the magpies immediately after receiving the mouse. Also, for some reason, he was making more frequent displays than usual, anywhere and everywhere. After about 10 minutes the mouse was taken to nest 1-36 as yesterday.

Brownie calling Nova to work.

B full song in nest.

Brownie sang a lot during the forenoon, giving the impression that he was trying to get Nova to come back from somewhere. (I had not seen her at all). Once I looked him up and found that he was singing thus while lying in his new nest. It will be recalled that Nova has always been rather independent and that in the case of one nest at least (I forget which, now, but it is in these notes) he had to travel far and repeatedly to bring her back.

Rhody Intimacies

Mostly concerned with his accepting assistance from me in building nest in glass house.

Rhody had been with me in the cage,where I was taking movies of him,for about an hour, when, about 3 P.M. he suddenly ran out, picked up a twig and went to nest 2-36. In a few minutes he was back again, got another twig and carried it up into the glass house. The next one (he was getting very busy) went to 2-36. Back again in a few minutes, he went to the glass house carrying nothing. I went there and stood below it. He began to whine, so I got a ladder, placed it, got some twigs (he continued to whine) and handed him one. This he took and placed it in the "nest" (A scraggly platform mostly put there by myself). He then came down about 3 feet and investigated a place where I had thinned out some dead branchlets thinking that the space thus made might prove attractive to him. I handed him a twig there, which he pulled rather roughly from my hand,-unusual behavior for him --and then took up and placed in the house. I handed him three more in succession, all of which he took gently--crying between times just like Terry--and placed carefully. He then came down, got a twig from the ground and took it to nest 2-36!

(Takes twig to 2-36!)

I work in his absence.

While he was away I rearranged the material in the house and added a lot of stuff taken from A and T's nest in the cage. When he came back he took a twig up to the glass house, for some reason

or other, had difficulty about getting in, tried a new route, then another one beginning with the roof, gave up, and took the twig to nest 2-36.

While he was there I inspected the surroundings of the glass house, cut out a few interfering twigs and fixed a perch a foot or so below it where it would be handy for him to use going in and out, and awaited results.

He came back (about 4 o'clock) walked around slowly, more or less aimlessly, then sauntered over to the dormitory tree, looked up at the house, decided to go up. This he did by the new route via the perch. He must have wondered how all that stuff got inside But he adopted it at once, and although he had gone up empty "handed" began to rearrange things to his satisfaction.

After about 5 minutes he bethought himself of the magpies, entered the cage, and as it developed, was finished for the day with both nests.

Telephoto survey of R's topography in detail.

I joined him there in an endeavor to get some colored movies of him doing his mouse stunt, but he was also finished courting for the day. However, I did get some, including a detailed exploration of his topography with a 4½ inch telephoto lens at a distance of 8 feet, under somewhat unsatisfactory light conditions as shadows of trees to the west were encroaching upon the field of view.(Also structural parts of the cage). In these telephotos only a small part will show at a time, such as head and part of the neck, owing to the restricted field. As he was extremely docile and unexcited, he unfortunately did not exhibit the colors of his skin patch.

Present pattern of mouse display.

The mouse display, at present, follows this pattern, when that animal is given to him while he is in the cage:

He takes the mouse, kills it without slapping it upon the ground unless it is a very large one. Begins display when it no longer struggles. This consists of raising crest, showing skin colors fully: blue, white and scarlet; bowing and facing to right, left and rear; hrooing softly; tail raised and wagged vigorously in more or less horizontal plane. He goes to inner cage, makes circuit displaying at intervals, comes out, passes magpies without displaying (one exception), comes west out of door, turns south, turns east and trots along south front of cage. If I am there, says: "Coot, coot, coot, ... softly and rapidly as he passes me (only), turns north at corner, goes to mirror, displays for few seconds, then turns east, trotting along path 3 to 6 feet, stops, displays and so on for 10 minutes or so, when he takes it to either nest 1 or nest 2, where he stays for ½ hour to 2 hours.

Formerly he went all over the country with it and carried it from ½ to 6 hours, calling at times. Now, no calling at all.

April 20th.

I did not see Rhody until 11:45, at which time I returned from a round of all of the nest sites, including those of last year, seeing and hearing nothing of the roadrunner tribe.

Rhody's nest No.4-36 in glass house.

However, as I approached the cage at the time mentioned, there was Rhody just entering it with a bill full of nesting material. When he saw me, he came out, carried it up to the glass house and carefully placed it, crying as I approached. I suppose this nest will have to be called 4-36.

Searching abroad in forenoons?

Indications of the last few days are that he has resumed search for a mate abroad in the forenoons, although he has not been heard to sing, nor has he been actually followed to any con-

siderable distance to verify the supposition.

Goes to 2-36 next.

When he came down from No.4. he first visited the magpies, then accepted worms from me, crying between worms, then gathered more twigs and took them to No.2.

R is moulting.

There is no doubt of his being in a spring moult; besides seeing them float off whenever he preens, his feathers are now found "everywhere" about the place.

B and family also

Brownie and the whole thrasher tribe have also been out of sight and sound most of the morning. A curious coincidence. He did not look me up once and was not heard until about 11:50. Later they were all located near the S.W. corner of the premises--an unusual place for them.

The reason for this seems to be that, now that the contestof wills is on between B and Nova to determine whether she shall occupy the new nest or not, Brownie has to go in search of her when she does not respond to call. The youngsters naturally follow him and Nova has been going off to the west.

R's attitude toward dead mice.

Going to the cage about 4 P.M. after an absence of several hours, I found Rhody there loafing comfortably. A mouse,which he himself had killed about 24 hours earlier, was there still uneaten. Yet, when I offered him a live one, he took it, did most of the usual things, but instead of taking it to one of the nests, ate it in about 10 minutes--a variation from recent procedure. It has been observed several times, both with Rhody and his two children, that dead creatures, that is to say, those found dead are not usually acceptable.

April 21st.

Light rain falling in the morning.

Rhody was found in his shelter under the old oak, although there was little rain falling and there had not been enough to dampen the ground under the trees.

Brownie and youngsters were perfectly dry, all three ready for worms. Nova out of sight, but heard.

R goes to work on first nest again.
Mouse-routine changed.

Rhody, after having worms and viewing the magpies, decided to work on nest 1-36 for a change--the first time he has been seen to do this since 2-36 was started. (Notes may show otherwise).

Later, when given a mouse, he took it also for the first time in weeks, to display at the Scamell dining-room windows, thence to the roof in two stages, there to sit or lie down with it, as the spirit moved him, for about an hour, possibly more, as I did not wait to see the end. Not once was he heard to call, but two or three times, he stood up and wig-wagged. I had hoped to see a revival of his courting behavior, including calling, in view of this departure from his recent behavior, but it was not to be.

Rests in 1-36.

At 1 o'clock he was lying down in nest 1-36.

At present such nest building as he does seems to be distributed amongst 4, 2 and 1. (1:30 P.M.). though it can not be said that he is very active at any of them.

This odd behavior offers plenty of ground for speculation asto underlying reasons, but perhaps the evidence is not yet all in.

Rhody and hummingbird.

While I was in the cage with Rhody yesterday (I forgot to record it) an Allen hummingbird buzzed about outside the wire seeking a way in order to pay its respects to the roadrunner. Final-

it drifted in through the two doors and hovered about his head for perhaps a half minute, then wandered about the cage and went out through the netting. Rhody was not interested at all, yet a butterfly much farther away will usually be chased energetically.

At 2 P.M. Rhody was still lying in nest 1-36.

Shortly after he was heard to give his cooing song--the sound I have been waiting for as a possible indication that he would , since the departure of A and T, become more active in looking for a mate.

At 2:30 he came to where I was digging near the cage, watched for a few minutes then went to the cage and stayed inside until 4 o'clock, leaving, presumably, because a yellow-jacket was annoying him where he sat in the upper closed portion. (This will be referred to later).

At 4:15 he was again found in nest 1-36 resting quietly.

About 4:45 he was inspecting the canopies of the trees between 1-36 and 3-36 as if looking for a new nest site, soon coming to a tree near where I was working, sitting there, occasionally whining softly while looking in my direction,

At about 5 he returned to the cage staying until 5:30, then came out, dusted (always a preliminary to a departure for his night roost) halted by me in expectation of worms, which he got, and at 5:40 left for his roost, which is still in the Canary Island pine.

Returning to the yellow-jacket episode: Rhody, as these notes record, is afraid of them, whereas Archie and Terry, also as the notes show, were not, though they were careful to see that their business ends were put out of commission before swallowing them. There was a distinct difference in the attitude of the two generations toward these wasps. (If they are wasps).

They did not inherit Rhody's fear of them, yet they did have an instinctive foreknowledge of the dangerous character of these insects and the location of their weapons of offence, doubtless an inheritance. Rhody, probably, had been stung and learned from experience. A and T doubtless had not been stung and acted on instinct. As judged by A and T, fear of yellow-jackets formed no portion of a "congenitally organized pattern of behavior".(I mean: fear of yellow-jackets flying about). As these youngsters, presumably, should follow the "pattern" of their ancestors, perhaps we are warranted in assuming that roadrunners have no pattern which involves fear of flying yellow-jackets; yet Rhody fears them. Therefore Rhody has learned that fear from experience, hence has intelligence of an order sufficiently high to permit of learning and remembering sufficiently disagreeable experiences and to act (run away) in such a way as to avoid their repetition.

Without presuming to attempt to follow through the mazes of a controversial subject, a subject upon which I am not informed anyway, it seems to me that we have here an example of the difference between intelligence and instinct in practical operation, using the two terms in the broad, popular sense, in which instinct is that faculty of an animal which enables it to act, without learning by experience, automatically and without reasoning, ~~overcome~~ with more or less efficiency, in its own protection and well-being and the perpetuation of its race. Whereas intelligence implies ability to learn, however little it may be, and act on the basis of that learning.

at least

Rhody has learned to run away from yellow-jackets, although he does kill them if they come too close, but he does not chase them. Archie and Terry, on the other hand, chased them and never ran from them. They had not learned that they could be stung by an insect

even when they had not attacked it, nor had they "reasoned" that there is such a possibility. Their treatment of yellow-jackets caught by them differed from their treatment of flies, from the very beginning, in that the former were always given more thorough treatment and never eaten without it, whereas flies were frequently swallowed at once, though not always.

February 22nd.

9:30. I have just had an experience with the thrashers showing something of their capacity to learn by observation and experience. Now I have made no attempt to tame the two youngsters of B's present brood. I visited the nest rarely while they were in it and have not cultivated their acquaintance, except indirectly through Brownie, by giving him worms for them. On a few occasions (all recorded in these notes) they have followed him to a few yards from me, and there waited for him to serve them.

A half hour ago, when seeking to determine whether the thrasher in the new nest was B or N, by the indirect method of looking for Brownie in the orchard, I saw one of the youngsters outside the fence, all alone. On seeing me it ran away from me parallel to the fence, reached an opening under it, reversed its course and ran back about 10 feet directly toward me, having apparently come through the opening in order to reach me. It stopped about 10 feet away and stood quietly facing me. I tossed a worm to it, which it picked up and ate, coming closer and closer as I dropped each successive worm closer to myself, until it stood within reach near my knee, waiting for each worm offered. This was my first attempt to gain the confidence of this bird and its first experience of me as an actual direct provider of food.

It seems reasonable to suppose that it had already learned by previous observation that Brownie got from me the worms that he had been giving it(or that Brownie was likely to be found in my presence and hence, in B's absence, it instinctively came to me. Whatever interpretation may be put upon this behavior, it seems clear, that somewhere in the chain of events, learning entered the picture. Certainly this youngster was not equipped at birth with a pattern which included me as an instinctive source of a gratifying sensation, otherwise it would have come to me from the very beginning.

Incidentally the bird in the nest was proved to be Brownie's mate, because on leaving the youngster after B came to feed him, I returned to the nest and found the mate still there and B still with his offspring.

It looks, then, as if B had prevailed upon his mate to get busy. (Otherwise expressed: The time has come for her natural impulses to prevail, insofar as they bear upon reproduction).

Up to about 10:30, when I left, Rhody had not been seen, even in any of his nests. When I returned at noon he was lying in 1-36 doing nothing. He reappeared at the cage at 2:10, coming from the direction of 1-36. He did not go inside but stared at the inner compartment for a minute or two, then departed for 2-36 where he was found later. At 5 P.M., without having been seen in the meantime, he reappeared at the cage, on top, came to me for a mouse and took it to nest 1-36 after his usual display at the mirror. At 5:30 he was still there when I left.

While I have no positive check upon his movements, I believe he was in one or other of the nests practically all of the time that he was not near the cage. That would be 2 hours or more in each.

He was not heard to sing during the day.

The thrasher nest was observed several times during the day, and always had an occupant. Two changes of shift were seen. This means that there is one egg.

Whenever Brownie was off duty, the young birds were easily located and he fed them both. When Nova was off they not found at all.

April 23rd.

Rhody not seen anywhere, including all of the nests, up to the time I left at 9:30 A.M.. I returned at noon and he still had not been seen.

At 1:05 I went to the cage. He was inside flirting with the magpies, but when he saw me, he dropped down from the perch at once and trotted out of the cage to me, standing in front of me expectantly. I went and got him a live mouse, bringing forth the usual display. This time, however, he went part way up to nest 4-36 with it first, but changed his mind and went to the mirror where he bowed low before it as if offering sacrifice before a shrine. He took this mouse to nest 2-36 at 1:15.

When he stood in front of me on first coming out of the cage, he inspected the ground at his feet to see if he had missed any worms that I might have tossed without his having seen them. This behavior has been witnessed and recorded in these notes before.

The feathers that Rhody has been moulting are mostly frayed at the tips or with tips completely missing. I found today one such larger than he has been casting off recently and as I have had a strong impression recently that Rhody is darker than he used to be, took it to the M.V.Z to compare with roadrunner skins to see if there might be anything about the original color of the tip to account for the darkening noted after it was lost.

With Dr. Grinnell the feather was first compared with an April skin and proved to be an inner secondary flight feather from the left wing. The corresponding feather of the skin had also lost its tip. Comparison was then made with an October skin. The corresponding feather had not lost its tip, but the color of the tip was no different than the bronzy green basic color of the main portion of the feather.

However, the October bird was much browner and lighter than the April bird, Dr. Grinnell pointing out that this change to a darker shade, from new to old, was normal. Rhody, therefore, is darker than he "used to be".

Incidentally this corresponds with the observations recorded herein on Brownie, where it has been shown that he was lighter in color after the moult.

On returning at 5:30 Rhody was overtaken on the driveway headed for his night roost, but he stopped when I stopped the car and came back. Although he willingly accepted worms, he soon edged past me in order to inspect the car critically. He seemed lost in admiration. A weakness for automobiles on his part has often been mentioned in these notes, but this is the first time he has been known to desert a banquet to indulge his interest in them.

April 24th.

9:40 A.M. Unless Rhody knows something that I do not, such, for instance, as where he can pick up a mate any time he feels like it, or that his attractive powers are such that no effort on his part is necessary to cause one to come to him voluntarily wherever he may be, present indications are that, as in the case of the Carthaginians at Capua, the luxuries of an easy life are insidiously sapping his ambitions and he no longer has the pep to take the field aggregessively. While he still continues to perform his courting actions, he no longer captures his own mice, lizards, etc. as love-tokens.(He wants them handed to him). Perhaps worst of all is his substitution of Hamburger steak from a dish for wild game captured in the fields on his own resource and initiative. In this respect, of course, my influence has been bad, but I would like to see him do something for himself like a man-roadrunner.

About 8:30 he was going through his evolutions at the mirror with Hamburger. At 9:05 he accepted gratefully a young white rat, which he proffered to his image. (He is becoming a Geococcyxicomorphist!). After a few wanderings, never more than 30 yards from the cage, including ascent to the top of an oak, he strolled in the direction of 2-36, displaying every few feet, and finally went up to the nest itself. There, I suppose, to lie and digest.

I have developed a rat-roadrunner economic process that is working out well at present. I feed household scraps to two female white rats. These bear young at short intervals. (24 in the last week). The only problem is to coordinate the production rate with Rhody's appetite and throat caliber, since the size of rat he can swallow has its limits and he will not eat more than just so many. It will be seen that, if Rhody should propagate successfully, I have within my reach a method of converting economic waste into roadrunners, and at the same time change unacceptable food into acceptable. (The order should be reversed).

History is repeating itself with Brownie and his brood. About 10:30. with Brownie on the nest, I discovered the two young thrashers at the oval lawn. By the usual device of tossing worms so that they would have to approach closer and closer to get them, I soon had them both beide me taking worms tossed to them 2 or 3 feet away and not alarmed by the tossing movement. They are now,both of them, big and strong, though one is larger than the other. The larger was more enterprising and soon the smaller was begging him for food. He allowed the latter to take half of a worm which he held in his bill and then all of it without resisting. Soon both would have been eating from hand. But Brownie came and knocked over first one and then the other, not very roughly, although it sounds so. B then ate the worms I gave him, turning occasionally to attack mildly one bird after the other, feintingly. Both resisted spiritedly and each in turn gained a victory over Brownie, each driving him from the field. Nobody was hurt and neither youngster gave ground or left. Brownie next alternately fed and shadowboxed with each bird, finally giving them both a good feed and left By this time their wants were satisfied and they drifted away.

Again we see the preliminary training in self-reliance, to be followed in due course by less gentle treatment and eventual ejection from the premises with neanful blows and unrelenting pursuit.

We also see Brownie,again, first as an aid in establishing contact with his offspring and then as a hindrance in maintaining it

Rhody, with his precious mouse, remained in 2-36 for only a

half hour, to return to the cage for a visit with the magpies. This becoming boresome, he wandered near aimlessly until it occurred to him, on running across a twig accidentally, that it might be a good plan to take it to 2-36, which he did.

During the rest of the day he returned frequently to his study of the magpies, had another young rat with the usual trimmings, nest 2-36 again being selected for its consumption . Now (5:15 P.M.) he is watching every movement of the magpies from his perch inside of the ~~12~~ 9 x 12 extension, with an air of intense concentration.

About 2 P.M. I found one of the young thrashers alone. In a few minutes he was taking worms from the palm of my hand. Brownie came, followed by the other one, and fed both faithfully, with no tricks.

April 25th.

About 8:30 A.M. Rhody was out on the high lot to the S.E. where Selborne Drive joins Estates Drive. I went out to identify him positively and when I returned he trotted along behind, almost like a dog, following me to the shop. Instead of coming in, he saw a twig in front of him and took it up to the observatory, flying down to land at my feet when I showed him a young rat. After the usual evolutions, including the mirror act, he went with it to 2-36.

(Absent until 3:30 P.M.). On returning found R in the cage. The rat act was again repeated.

His favorite nest seems to be 2-36, though he still likes to rest in 1-36. 3-36 seems to have been definitely abandoned and 4-36 (the glass house) has not been visited for a day or so.

April 26th.

Rhody always does something to nullify my tentative conclusions!

At 8:30 A.M. I looked around for him without success; then I heard the glass panes in the glass house rattling slightly, and there he was. He paid no attention to me, but tore loose twigs from the inside of the tree that had been shade-killed and placed them in his nest in the house.

At 8:50, after writing the forgoing note, I returned to watch operations on 4-36. No Rhody, but a rattle-boo sounded from the direction of 1-36. R was found in it whining and looking down at me. I returned to get a young rat and on my way back to the nest, saw R approaching. He quickened his pace as he saw me, took the rat, bowed, etc. and returned to 1-36. He did not go to the mirror (Too far away?).

Although I was absent during the next two or three hours, Rhody was seen to enter 4-36 twice more up to 12:20.

The last occasion was preceded by his discovery of a brown towhee nest in the same tree, about 8 feet from the glass house and 2 or 3 feet lower. I had not seen it before. He went over to it and stood looking down into it for perhaps a minute and then went up into 4-34. Examination of the towhee nest disclosed two eggs. Thus, again, Rhody rejects birds' eggs as food. However, when and if a brood is reared in the nest, (or any of the eggs hatched) I shall have none too great confidence in his ability to resist temptation.

About 2 P.M. Rhody descended from nest 1-36 where he had been "resting". He appeared in a receptive mood, so I walked slowly

followed by him. He waited at the door for the young white rat I gave him, displayed as usual, wandered about aimlessly for several minutes, bethought himself of the mirror 50 yards or so away, entirely out of sight and to be reached only by a devious course, ran to it, displayed, wandered a few minutes more, then took the rat to 2-36.

Thus, in the last 2 or 3 hours, he patronized three of the four nests, No. 3 being still disregarded.

Young thrashers depart from norm.

In one external respect both young thrashers differ from all of the others reared here, in that each has a "mane" $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in length and about $\frac{1}{4}$ inch high. "Roughneck" had ruffled feathers on his neck that, in no way, resembled these smooth, regular, sharp-crested manes.

One of the youngsters (possibly both--I have not been able to determine as yet) differs in contour in two other respects also. His tail is notched (perhaps only temporarily) at the end, the middle rectrix, or perhaps the middle pair, being shorter than the laterals. Also his tail coverts are "swollen", so that, while his body outline tapers toward them, there is a swelling at the coverts, then a tapering off again to the rectrices. These three features make him look unthrasherlike.

Both young birds' irides have changed from the very dark brown ("black") of the nest to Greenie's hue.

3:30. I find that only one of the young birds has the "swollen tail coverts, but the tails of both are alike.

To test Rhody's capacity for rats and mice, a small wild mouse was offered him about 5 P.M. He accepted it at once, but released it repeatedly following it about without attempting to kill it for several minutes. If it seemed about to escape, he picked it up by the skin, then laid it down again. Finally it was killed and abandoned.

April 27th.

Nest 2-36 was chosen by Rhody for the first rat. A second one given him at 5 P.M. was quickly killed and eaten on the spot, without any fancy business at all--the first time he has done this for some time.

April 28th.

Rhody continued to behave according to form, patronizing nests 1 and 2, the cage and the magpies as usual.

The thrashers are busy and pretty quiet. The nest is never vacant. The youngsters are coming to me rather freely. B still feeds both. Occasional shadow-boxing.

April 29th.

Heavy rain from about 7 to 8 A.M., then clearing.

A rattle-boo outside the dining room window announced Rhody's presence. When the window was opened he came in, leisurely, and looked about. (8:15).

A young rat was accepted by him without display of any kind. He got it part way down, then rejected it.

A live mouse, smaller than the rat, was then given him. There was no display with this either, though he carried it about for some time, finally gobbling it.

Next in order was sunning and preening. During the latter operation the first tail-feather of the season was removed: one of the two middle rectrices. It was measured and found exactly 12¾ inches long from tip to tip. (324 mm.). It is ¾ of an inch longer than the feather from the same place last year. (19mm.). Its coloration is essentially the same basically, but it is decidedlydarker, with far less coppery-metallic reflections. Though both feathers are worn somewhat at the tip, it looks as if this year's feather were longer when perfect.

Rhody next wandered off to the west of the house. His attentin being attracted by some pine needles, he gathered them up, went to the mirror about 75 yards away, where he showed them to his reflection briefly, then took them to 2-36.

Now this place has pine-needles all over it. They can be found anywhere near the nest also, with no necessity for carrying them such long distances. It would seem that this action of his is purely instinctive and when the impulse to build seizes him he simply has to obey, no matter where he may be.

It is curious, also, that he utterly ignores the mirror except when he has food in his bill, or nesting material. The fact that he makes but a short stay at the mirror, a few seconds at a time, suggests that he has some sort of a dim realization that no practical result can follow from his display before it.

At about 1:30 P.M. he was given a small, live house-mouse. The usual behavior followed, including a visit of about 30 seconds to the mirror. At the mirror his tail wagging and bowing always become intensified. This mouse was taken to nest 1-36.

About 5 P.M. Rhody was given another similar mouse, with the same results, except that, this time, he took it to nest 3-36 after visiting the mirror. I had thought that this nest had been forgotten. Certainly it is not highly favored, for he soon left it and took the mouse to 2-36 finally after much hesitation, due to the exceptionally noisy operations on the house at the moment.

April 30th.

I saw and heard nothing of Rhody until about 9:15 A.M. when I went to nest 2-36 to see if he was there. As I approached his whine was heard coming from it. As I stood below it, he came to life and began to rearrange twigs inside.

At 9:30 he came to the cage for a session with the magpies, leaving shortly to go to nest 3-36. Again he stayed for but a short time, then began to climb about inside the tree. He found a new towhee nest. (I had found it myself 3 days ago). He examined it inside, deliberately walked across it and came down.

Next a twig attracted his attention. This he carried to the mirror and pressed against the glass repeatedly without display. Next in order was to take it to 2-36; but instead he took it up into 4-36, returning to watch the magpies some more and loaf about to see what I was going to do about mice and rats, since he had had none this morning.

I wanted to get a colored movie of him displaying with a mouse and made the necessary arrangements. Instead of doing his part as was to be expected, he gobbled the mouse without performing any

of his customary ritual. (Got about 4', f5.6 , 8'dis. Bright).

(The towhee nest was examined and found not quite ready for eggs).

Rhody was about all day. In the middle of the afternoon he went up about 20 feet in an oak 30 or 40 feet from the cage, cried when I approached, began breaking off twigs and placed them in a new place in the same tree. He did not keep this up long, so I doubt if it is intended as a nest. It may have been only that strange reaction to my presence, which looks as if were trying to convince me that he was not loafing, but engaged in serious enterprise.

He chose No. 1-36 as his principal resting place for the afternoon, coming down about 5:15 to visit the cage. I called to him from about 40 feet away and moved toward the shop to get a mouse. Although he could not see me after I had walked a dozen yards or so, he soon appeared at the door whining. He watched my actions knowingly as I fished out a mouse a couple of yards from him, took it unexcitedly and, in the absence of the mirror, used the tool-house window instead. He then proceeded down the driveway, bowing, wagging and hrooing softly every few feet, thence up to No. 1-36. He did not go to the regular mirror at all, being evidently satisfied with the window as a substitute.

Now it seems quite clear that following a human being to a house by a devious route in the expectation of getting food forms no part of the inherited mental equipment of roadrunners. Consequently Rhody learned from his own personal experience (with me) that a certain behavior on my part, if matched by a certain action of his, results in satisfaction of a certain want of his. This requires intelligence, for, to paraphrase Major Hingston (Instinct and Intelligence): Instinctive action is independent of instruction, is unassociated with any reasoning and while it has a definite end in view, the individual is ignorant of that end.

Rhody's action was not, therefore, an instinctive one (except after he got the mouse) because he learned, associated effect with cause and guided his action accordingly.

After he got the mouse his action was probably mostly instinctive, yet I think, even then, he showed intelligence by quickly abandoning his display before the window; that is, he had learned from experience that no good came of prolonging it. Remember his initial bouts of several hours with it.

Aside from the difference in length between present andpast performances, it is interesting to note the difference in other respects, bearing in mind that, at present, he is seeking a mate, whereas, when he first got acquainted with the mirror, he was not.

The earlier affairs were accompanied by widely spread tail and wings, much posturing and shifting of position, pecking at and behind the mirror, etc. all to the point of exhaustion, and apparent inability to quit, with many returns.

At present the object is merely pressed against the glass and the tail wagged sideways, with bowing and hrooing (if it is food), but without, if it is nesting material. He leaves without reluctance.

Intelligence of Spotted Towhee.

As I sat in the cloister at noon having luncheon, a female spotted towhee alighted in a hibiscus within reach and waited patiently. She did not want any of the crumbs set out for birds nearby. This meant that she wanted worms for her brood, as was proved by her taking them at once when tossed to her, "crimping " in her bill, carrying off somewhere, then returning for more. This was the first time this year that she wanted worms and the first time in about a year (since last breeding season) that any spotted towhee has shown any specific interest in me. Last season this bird (undoubtedly the same one) likewise displayed sudden interest in me as soon as she had young. (Last year I verified this by following her to her nest). As long as she was feeding them, she came to me for worms, wherever she found me.

We have here a case of learning from observation, remembering, associating cause with effect; more explicitly: a case of this bird learning that worms could be had from me, remembering this for a year, putting the knowledge into effect only when great need for food became a source of concern. This, to my mind, is intelligent behavior.

Rhody resumes his calling for mate.

May 1st.

At precisely 7:08 Rhody's cooing song was heard not far away. He kept it up for about an hour, then it was no longer heard. At 7:30 his location was seen to be the Scamells' roof. When the calling stopped I looked for him all about this place, including all the nests. He was not to be seen anywhere. About 9 I drove slowly through the territory to the north-east, stopping, looking and listening frequently, covering four miles, returning at 10. No results. He was not at any of the nests. Presumably, therefore, hunting abroad.

At 10:30 he was sitting quietly in 1-36, crying as I approached, but not resorting to his bluffing nesting activity. Evidently this is under control of his will and perhaps borders upon an intelligent act, if it is not completely such.

(As I came out of the shop door on my way here to write the foregoing note, the spotted towheee flew from a tree and landed at my feet. She is now, 11:30, outside the window waiting for me to come out).

At 1:30 Rhody was again found in 1-36.

At 3:30 he came into the garden where I was working, cried, then followed me into the shop-yard for a live mouse. On the way there he paused below the thrasher nest 6 feet over his head and seemed disposed to go up and investigate, but did not. After his usual cavortings, not including the mirror, he went to nest 1-36 again.

Today, then, it was this nest that received most, if not all, of his attentions.

May 2nd.

At 6:50 A.M. Rhody was glimpsed on his way up to the roof. He was down at 7:15, not having called in the meantime. After 10 minutes of sunning, preening and hesitating about going up to 4-36, he picked up a twig and carried it to 1-36.

8:07. Rhody has not been heard to call this morning. Until 10:20 he was not to be found anywhere about the place, but at that time he was discovered sitting quietly in 1-36. When I talked to him (from a distance of about 20 feet) he began to whine and stir in the nest. He then rearranged afew twigs about

the rim and rubbed himself down hard in it as if to shape it. He then settled as if incubating and I left to make this note.

It is possible, of course, that Rhody is incubating--I have never looked into the nest. From all past behavior I have assumed him to be a male, but I have no proof of it whatsoever, merely circumstantial evidence , as it were. All of his actions have been those associated, usually, with males, but there is a possibility that roadr unners, like some other birds, reverse the usual attitude of the sexes toward each other.

There is also a possibility that Rhody has a mate that I have never seen and that she has laid in the nest without my having seen her--a very doubtful contingency.

Again, R may be a female with an extremely shy mate somewhere out in the hills and making occasional visits to him, then returning to lay an egg! Naturally the egg affair can be settled at any time by putting a ladder up to the nest, but this I do not want to do for several reasons.

At the moment the most plausible supposition appears to be that Rhody, by sitting so long in the nest, is simply carrying out impelled by instinct, his portion of the breeding pattern. That is to say, he is now doing his share of the incubation which normally should be in progress now, but which is not actually taking place because there are no eggs by reason of his being mateless.

During the rest of the day he was not seen to visit any other nest, but he sat in nest 1-36 twice more.

He is paying much less attention to the magpies now.

May 3rd.

Rhody did not sing at all yesterday, nor has he up to now, 7:30 A.M.

At 7:15 Rhody, or at least a roadrunner, was sitting motionlessly in nest 1-36. I suppose it was Rhody, but did not talk to him to find out, thinking that it might be a mate.

At 11 I heard Julio scolding Rhody by theobservatory where I was adjusting the clock of the equatorial . He seemed excited. I went down quickly. Rhody was trying to get at Brownie's nest and Brownie was defending it, making harsh sounds like a shrike. B attacked R fiercely, dashing at him from the nest, and R fled, only to return to the nest when B reentered it. This was repeated several times, B chasing R down the road. Julio said that, before I arrived, B had chased R about in circles, R using both wings and feet to escape.

Rhody was perfectly bare-faced about the matter, disregarding our presence a couple of yards away, where we had stationed ourselves in order to observe and intercede on the part of Brownie if necessary. Brownie's defense triumphed, although we aided to some extent by getting R interested in the mouse-prospect. R took the mouse and carried it to 1-36. He was still there at 1 P.M.

It was this sort of thing that caused me to put Rhody in jail two years ago. I doubt if he would have taken B's eggs if successful in driving him away, but I have no illusions as to w what would have happened if he found youngsters in it.

During the rest of the day Rhody stayed about the place, being seen several times in nest 1-36, but not in any of the others.

Notwithstanding the many evidences of tameness cited in these notes, he continues to be suspicious of strangers and in actual

fear of groups of people; thus about 5:45 P.M., when he caught a glimpse of four visitors through the trees he fled precipitately and would not even allow me to approach.

May 4th.

Rhody resumes song.

At about 7:45 Rhody began singing his mournful song from the roof, keeping it up for half an hour or so, when he went to the cage to watch the magpies.

Another nest in ontemplation.

(5-36?).

About 9:30 I could not locate him, but heard him rattle-boo. Even then I could not find him until he dropped down from the tree (p.1175) where he was watched placing twigs on the 30th. April. He pulled half-buried twigs out of the soft ground and placed them as if for a new nestin what appeared to be the same spot about 20 feet from the ground.

As I watched him he added more material which he tore loose from the tree itself. While placing it he cried and rattled his beak softly without vocal sound.

Twig-mirror ection.for new nest.

Unusually high location.

10:10. I found Rhody picking up twigs under the rhododendrons near the cage. He started for his new nest tree, suddenly paused, turned back toward me as if frightened, then ran to the mirror which was entirely out of his course, tapped it lightly a dozen times or so as if offering the twigs to the "other bird". Having thus conscientiously made his offering at the altar, he climbed up to his new "nest". This structure is actually already visible to the naked eye. It is at an unusual height for a roadrunner.

Takes rat to No. 1-36

10:51. At 10:20 Rhody was on the ground below 4-36 looking for nesting material, but abandoned the effort and came toward me whining. I invited him to the shop for a young rat. This creature was accepted with alacrity and carried to the observatory roof by slow stages, performing at each stop. After 10 or 15 minutes he sailed down to land near me, trotted by the shortest route (which was necessarily devious) to the mirror in order to make his devoirs, again demonstrating that,with food, his display is elaborate, whereas with nesting material, it is not. The rat was carried to nest 1-36 and eaten there, but not until he had satisfied himself that there was nobody there to receive it. (10:4 He then settled firmly in the nest.

1:40. By noon he was out again lying on the ground flat as a pan-cake, sunning himself in the spread-eagle pose, following up by an inspection of the magpies. I left him thus engaged. After lunch he took up the chase of one of Brownie's youngsters after B had quit to come to me for food. R's chase was not pressed far. Next he rushed over to watch a towhee chasing another and seemed disposed to take a hand, but his attention was diverted by theother young thrasher, whom he followed a short distance slowly until the youngster flew off.

This left Rhody with nothing to do but preen and sun himself in the glade where I sat. In order to get a comfortable place in which to lie he pushed clods out from under himself by sidewise thrusts of his feet, one at a time--the only earth-moving action performed by roadrunners, with their feet, seen here.(I.e.only typ

Next it was in order to start nest building, by picking up a twig and heading for No.5, changing course to present it at the mirror, dropping it there, substituting another, taking it to 5, placing it, then whining(at 1:40).

At 3 P.M. R was in the cage resting upon my Upper Sonoran scenery.

At 3:30 he came out and hung around me, so I decided he was wondering about mice and rats again. Accordingly I walked toward

the shop, through the yard and thence inside. In a half minute more or less, Rhody was at my feet picking up the young rat which I had accidentally dropped upon the floor. Then followed the usual ritual, including the mirror display, with slow march to nest 1-36.

For the last day or so this nest has regained its position of being the favored one.

At 6 P.M. Rhody was still (or again) reposing in No.1.-- the latest he has ever been seen there. I should think he would adopt it as a sleeping place. He certainly looks comfortable in it.

At 7:30 P.M. he was not in the nest.

May 5th.

At 7:55 A.M. Rhody was found sitting in nest 1-36, not having been heard to call in the meantime.

An incident noted yesterday, but not recorded, illustrates Rhody's awareness of the dangerous character of honey bees. His fear of yellow-jackets has been commented upon previously. This incident also shows that he also is probably not guided by his sense of hearing alone in judging. He was carrying the last rat along a path when an old, decrepit honey-bee, evidently about finished, fell to earth directly in his path about 3 feet away and crawled feebly . R immediately halted, then took a few steps toward the bee, stared at it, then made a semicircular detour about it of about 18 inches radius.

He thus puts honey-bees and yellow-jackets in the same category. He may, of course, and probably did, hear the bee buzz while it was still in the air, but it did not buzz when on the ground.

Rhody gets busy on 5-36

10:35 A.M. At 9:15 A.M. Rhody was no longer in nest No.1-36, but was discovered pulling twigs out from the mulching around the rhododendrons near the cage. These he carried up to nest 5-36, which is still almost "invisible". When it appeared that he really meant to work seriously I began to keep count of his additions to the nest. In the first 10 minutes during which he was under observation he carried up 4. In 21 minutes he had added 10.
I then began to time individual trips to the ~~next~~ nearest half minute, giving the following table:

11 in 24 minutes,
12 " 26 "
13 " $27\frac{1}{2}$ "
14 " $29\frac{1}{2}$ "

I now began to time to the nearest $\frac{1}{4}$ minute.

15 in $31\frac{1}{4}$ min.
16 " $33\frac{1}{2}$ "
17 " $35\frac{1}{4}$ "
18 " $37\frac{1}{2}$ "
19 " $39\frac{1}{2}$ "
20 " 42 "
21 " $45\frac{1}{2}$ " (He has to go farther now).

I was sitting about 30 feet from the base of the tree. He was getting material 6 to 60 feet from me and about 10 to 40 feet from the tree. Some of it at the same level and some 5 to 10 feet lower. All twigs selected had oneor more forks and ranged in

length from 6 inches to 2 feet. All were taken from the ground. Most had to be pulled out from the ground or from tangles of detritus under the trees. In the time intervals shown they had to be found, selected, pulled away from attachments and entanglements, carried along the ground from 10 to 40 feet, surmounting elevations of from 0 to 10 feet before reaching the level of the tree base. Thence they had to be carried by flight and climbing up through the interior of the tree by a zig zag course rising about 20 feet vertically and covering perhaps the same amount horizontally. (This is a high nest for a roadrunner). They also had to be forced through obstructing branchlets and each definitely placed in the structure and the bird had then to descend, sometimes by climbing higher to get a good take-off, and sometimes climbing part way down, then sailing the rest of the way. There were times when he was unable to free twigs from their surroundings, and others when he tried unsuccessfully to detach twigs from the growing plant,or tree in which the nest itself is.

Further, occasionally Rhody had to "rattle-boo" from the nest and look down at me and whine. Notwithstanding these irregularities and distractions his goings and comings were surprisingly regular. (11:16. I will suspend note writing and see what Rhody is doing.......11:19: He is still working on No.5, having just extracted a twig from the rhododendron mulching 10 feet from me without appearing even to notice my presence).

Continuing the table of observations:

22 in	49½ min.	(This longer interval because I went and talked to him, while observing progress).
23 "	51¼ "	
24 "	54 "	
25 "	57 "	(He is now looking for finer material and rejecting coarse).

(He has to look more carefully and discover its location. As he came near me I picked up some fine Baccharis twigs and said: "This is the kind of stuff you need now for a binder." He was trying to pull rootlets of broom from the growing plant--an impossible task. He took the baccharis from me and headed for the tree with it. Something was not just right about it, so he dropped it and found something better:

26 in	62½ min.	(Showing time lost).
27 "	65 "	(He has to go down to the road for this).
28 "	67½ "	
29 "	69 "	(He has gone back to coarse).
30 "	71 "	

Observation period ended here, although he kept on working. The showing made on the nest itself in this time was surprisingly insignificant considering the really tremendous effort.

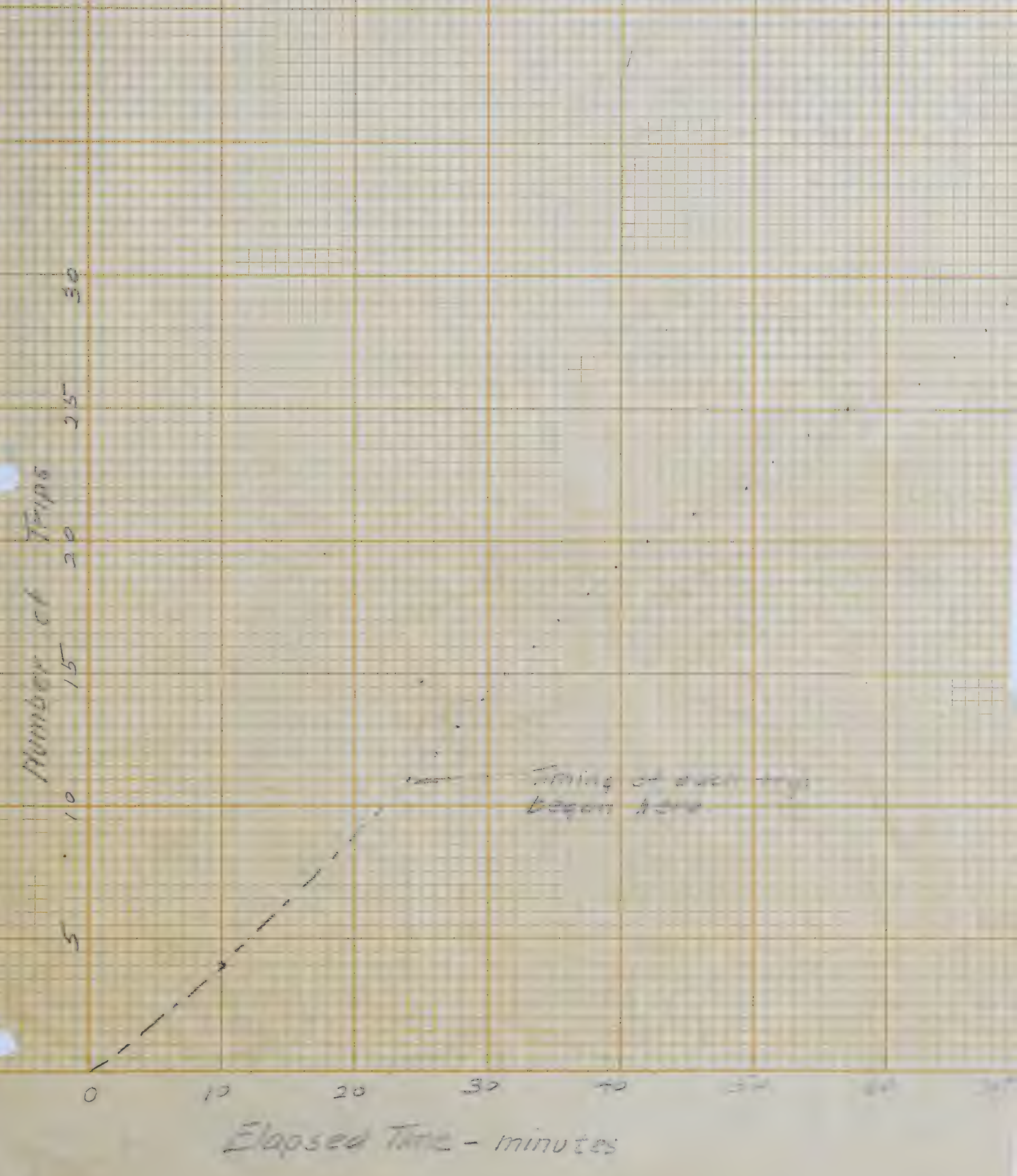
Roughly, it will be seen that he placed a twig about every 2 minutes, notwithstanding the amount of work involved.

In an hour he climbed about 5 or 600 feet vertically and traversed perhaps a quarter of a mile horizontally--all of the vertical height under load. Besides this was all the effort of overcoming resistances of various kinds--a no inconsiderable task.

There was no rest at all. Considering that this is the fifth unproductive nest of the year so far--and he has really made almost no physical progress on it--and assuming that all this effort is directed by instinct, unguided by reason, it would appear that instinct alone can be a pretty uncomfortable thing to be burdened with!

11:55, Well, Rhody is now resting quietly in his new nest.

Graph showing roadrunner activity
in nest building. Time *vs* number
of trips.
(See p.1181 of notes for comment).



The graph (p.1180A) reflects Rhody's nesting activity during the observation period with curious fidelity, even to the change of rate due to my going and talking to him and his decision to use finer material, followed by changing back to more readily found coarser. (End of this note).

At 12:20 Rhody was still in the nest. When I suggested to him that he deserved a mouse after all of this exertion, he promptly descended and began to carry up more twigs. However, at 12:30, he saw the light and followed me to the shop for his mouse.

Besides really wanting to reward him for diligence, I wished to see what he would do when it came to making a decision as to its ultimate disposition, now that he was so single-minded about building. He took the mouse with the usual ceremony, including a visit to the mirror, thence to the tree of nest 5. There he stood,irresolute, for about 5 minutes, no doubt trying to disentangle his reflexes. No.5 had not apparently soaked into his consciousness with a firm enough grip to overcome the pull of No. 1, for there is where he finally went with it.

4:00 P.M. Rhody is again working on No.5 after having kept out of sight somewhere since about 3 P.M. Up to that time he had spent an hour or more in or on the cage preening in the presence of a visiting young man, with no particular concern. But about 3 he saw two young women approaching through the trees 25 yards away and immediately sought refuge in the inner compartment of the cage. To head off a possible panic, I left the scene entirely, with all visitors, giving him an opportunity to escape. We kept entirely out of sight and hearing, yet it was not until 5 minutes after they were gone from the place that he reappeared fromnowhere (he was not in any of the nests) and began work again on 5-36.

At 5 P.M. Rhody, in the cage, was invited out to the shop for a very small rat. The usual followed, although after reporting to the mirror, it took about 40 minutes for him to make up his mind to take the rat to 1-36. Most of this time he lay quietly on the ground with his victim in his bill.

May 6th.

At 7:20 A.M. I went out to see what Rhody was doing and found him working hard on 5-36, carrying up larger branches than ever. ("Twigs" hardly describes them). He paid no attention to me, but kept up his standard rate of about one trip every two minutes. He has a fine, stable platfrom now and seems to be building up a rim around it. In doing this, he uses not only the twig he has just carried up, but alters the positions of some already there. His selections do not appear to be made at random--he studies the interior of the nest before replacing any of its components.

An hour later he was at it as diligently as ever, showing no evidence of fatigue or waning interest.

At 8:35 one of the young thrashers was getting worms from me at the oval lawn. Suddenly he cried out in fear and bolted, followed by Brownie, who chased him into the bushes and then came to me for worms. One of these worms he took toward the second nest making the "bluebird" chirp. This I take to mean: one youngster, hatched yesterday. (I will check this guess by looking at back notes). I find that on Apr.22nd. that, without looking in the nest, I decide that there is one egg. (P.1170). The nest was never

unoccupied that day. Counting that day as the first day of incubation--probably, and yesterday as a full day of incubation, we have 14 days of incubation, not counting any of today. This checks out reasonably well with past experience.

8:45 This thrasher nest was built in the worst wind-gap on the place, as I recognized at the time. Today we have the first strong north wind since the nest was built. I just went out to see how the birds were faring and found both birds (parents) in the nest. Applying"double heat". This has been observed before under similar circumstances, for example: Brownie and Greenie in the first nest.

9:15 This was kept up for a half hour. A screen was then placed which effectively shuts offthe north wind from the nest and its occupants. The nearest point of the screen to the nest is about 8 inches. With all the disturbance incident to its placing Brownie kept his place.

1:00 P.M. Rhody is sitting in 5-36. A few minutes ago he was given a young rat which went through the regulation ordeal. With slight hesitation Rhody took it up to No.5 and ate it. This seems to be the sign of the sclakening in his regard for No.1, consequent upon his preoccupation with N.5, that I have been awaiting.

He worked on 5 most of the forenoon. When it was seen that he was going over the fence to the north for material, a supply was gathered for him and distributed on the ground about the nest-tree. It was accepted at once.

On one of his upward journeys in the tree with a an awkwardly-shaped and unruly branch his flight across an 8 foot gap was interfered with and he narrowly missed falling. The branch fell to the ground and he came down to recover it, but when he took hold of it, something about if frightened him, so he retreated with raised crest and in some excitement. He went back to it warily, again seized it and ran a few feet with it, only to become frightened again, and dropped it. He then watched it as if it were a living thing capable of doing him harm, but tackled it again with the same effect. It was then abandoned. Probably most of us have had similar experiences in handling springy objects that have a sort of malicious ability to fight back at us and can appreciate Rhody's predicament.

He continued to work well during the rest of the afternoon, occasionally showing a twig at the mirror, and at times resting in the nest.

From about 5:30 to 6 P.M. (after which I left him for a time) he sat quietly in the nest as if he were to stay there for the night. However, he did not, nor was he found later in any of his accustomed night-roosts long after his usual bed-time.

During the day he had not been seen to visit any of the other nests.

May 7th.

At about 7 A.M. Rhody was again busy at No.5, working diligently up to 11:30, when he went off for a stroll through the garden, examined other trees, fussed with branches in them, stared into open windows of the house, then went to the roof for a long period of gazing off over the Bay and the intervening territory.

He was not seen again until 5:10 P.M., when he suddenly appeared at the cage for meat and inspection of the magpies. Presumably

he had been away someplace, perhaps searching, during all that time.

In a half hour he was out of the cage picking up a twig to take to No.5, after showing it to the mirror. Up to 6:15 he did not come down at all and was there when I left. At 7 he was not there, nor at any of his regular roosts.

During the morning hours I got motion pictures of him carrying material to the nest, showing it at the mirror, etc. Also, on one occasion when I put my hand out for support, I found it was about a foot from an alligator lizard about one foot long. This creature was offered to Rhody. He ate the tail,which broke off during my handling, but was not very interested in the rest of the animal, except when it ran away. Most of this action was too fast for me, though some of it I "got". I missed a splendid opportunity of getting a close-up of Rhody's head with crest and skin colors fully displayed, which would have filled a frame completely, as he was standing 2 feet from the camera lens looking quietly at the lizard in my hand. Unfortunately the camera was not on a tripod, so I had to hold it on my knee with one hand and the lizard in the other. I was helpless as to close-ups.

May 8th.

At 7:15 R was inspecting the magpies, following by taking one twig to the nest. I then left.

At 8:15 he was again watching the magpies. He took a young rat from hand, displayed at the mirror, then took it up to 5-36, where I left him resting a few minutes later.

For several days now, 5-36 seems to have occupied his attention to the exclusion of all other nests. (Unless he started a new one elsewhere during his afternoon's absence yesterday).

It was on the 11th. of May last year that his fourth and final nest was found at Oakmore Highlands. The nest in which A and T were born.

In that tract there were, last week, 19 new homes under construction. In the high field there, where I relocated Rhody after an absence of 8 days (p.998) there are now 8 or 10 new house where there were none at the time.

Yesterday a house was started across the street from here. Nest 5 will be between 2 house under construction, about 80 or 100 yards (?) apart. While R will not mind this, the neighborhood as a whole is certainly less attractive to a wild roadrunner this year than least. As a consequence, and considering the lateness of the season, the chances of Rhody's getting a mate, and especially bringing her here, look unfavorable.

Another (??) roadrunner.

At 10:25 Rhody was under the nest tree, hesitating as to what to do next. I heard what I thought was a roadrunner rattle-boo sound softly as if coming from about 50 yards or so to the east. Rhody apparently agreed, for he cocked up his head and tail, looked in the direction from which I thought the sound had come, and responded softly. He gradually stole off in that direction repeating the call. I though I could hear him and another, but on account of the undergrowth could see neither. I madea very wide detour via the streets to a point abount 100 yards away to the east so that I could scan the vicinity from the outside, but saw nothing. When I returned at 10:40 Rhody was up in nest 5-36 again sitting quietly . It would quite in accord with precedent that, after having written the preceding paragraph, something should happen to nullify its context.

(The incident in this paragraph occurred about an hour after the preceding paragraph was written).

Archie and Terry

No certain report has been received of these birds since they were last seen by me and noted herein. Howver, the postman told Julio today that he had seen one of them two days ago at St. James Place, which is about one quarter mile to the S.W. on the steep slope of Indian Gulch. It is in that general vicinity that I suspected Rhody of being yesterday afternoon.

Has Rhody some clue?

During the rest of the forenoon, today, he worked but little on his nest, spending more time than he has lately on the high places: old oak, observatory roof, house roof, etc. He also booed much more often, but did not "sing". About 1:10 P.M. he approached me rapidly from the west, running along the lower road. He paused by me, wanted no worms, then ran rapidly toward the N.E. corner of the lot (where I thought the "other" RR was this A.M.) went over the fence and rapidly disappeared in the tall oats to the N.E. His bearing was that of one who had a definite objective in view.

At 2:30 he was at the nest again resting. When I spoke to him he began to rearrange it inside, or pretended to.

At 3:40 he was in the shade beneath the tree. Brownie was up in it singing under-song softly--the first in a long time. Rhody gave every appearance of listening intently, as doubtless he was, though perhaps not for esthetic reasons. When B left R returned to work.

This nest is becoming a huge affair and in one respect differs from the 8 others built (or partially built) by him, in that it has a high parapet for one half or more of its circumference. (As far as can be determined from the ground). When he is in the nest it reaches far above his head. It suggests a wind-screen, sun-shade or perhaps a tail-rest.

At about 4:45 Rhody accepted a large, live mouse with the usual genuflections, etc., including an offering at the mirror. (My Filipino boy, Julio, on seeing this, aptly called it:"Going to church"!).

Instead of taking the mouse to the nest after that, R took it into the cage, stood in front of the magpies without display and gulped it down. I wonder if he has a sense of humor?

He worked a little at the nest during the rest of the afternoon, taking one twig up as late as 6:15. I decided to follow him when he went to his night roost in an attempt to solve the mystery, but when out on the street on his way, a motor-car frightened him back into the garden. At 6:45 he was in looking at the magpies. I had to leave without getting the information sought.

May 9th.

R was at his nest about 7 A.M. He made one or two excursions off to the north east.

At 11:30 he came into this room to get a young rat brought in for the occasion. He found a window to display at, but he got no satisfaction, so took it to the mirror at the cage(about 75 yards away in a straight line and entirely out of sight on account of trees and the house itself). Instead of taking the easiest

and most obvious route via roads and paths he went up over the roof of the house by the most direct route physically possible, thus showing some conception of the location of the mirror with respect to this room.

During the rest of the day he was nearly always to be found--working at the nest, sitting quietly in it, watching the magpies, etc.

His interest in these birds is again on the increase.

There has been no renewed evidence of the presence of another roadrunner.

May 10th.

About 8 A.M., as I approached the nest tree, Rhody dropped down from it and trotted toward me--an indication that he was inclined towards mice, although rather early for him to be so interested. He followed me toward the shop, and without looking toward Brownie's nest at first, stopped abruptly at the foot of the tree in which it is built. He appeared to think, then looked up at the nest, went up near it and was promptly repulsed by the vigilant Brownie, Coming down to the ground with a disgusted boo, he followed me promptly into the shop for his rat.

In this instance, as in others, Rhody seems to have retained something like an accurate picture in his mind of the surroundings of some focal point of interest. He could not see the nest itself from the point where he stopped on account of the screen. He could, of course, see the screen if he looked for it. I was watching him all the time for just this sort of behavior, but as far as I could tell, he was not guided by sight in the first instance.

The present rat, like practically all of the others recently, was carried ceremoniously to the mirror, thence to 5-36.

Several times during the morning Rhody carried up lining material: pine needles and the velvety stalks and leaves of the grey-green member of the Compositae.

Whatever the significance may be, it is many weeks since Rhody has clapped his wings together over his back.

2P.M. Last June a hummngbird (probably Anna--the male was not seen there) reared a brood in a nest about 40 feet from the west window of the living room. The nest was allowed to remain untouched and gradually became flatter and misshapen during the ensuing months. Winter rains reduced it to a dingy mass filled with debris. From time to time I have glanced at it in passing out of mere curiosity. Just now, in passing it, I noticed that it seemed fully restored to its original form, with new lichens and bits of green moss applied to the outside. Also there were many of what appeared to be, the"shells" of some sort of pupa forming part of the decoration. Inspection showed that it contained one egg, and in a few minutes, the nest was occupied by the female. This is the first instance within my knowledge of a hummingbird's having restored and occupied an old nest; perhaps in this case, reoccupied

While looking at the nest I noticed two thrashers outside the fence in the bushes outside the fence. On call, both came to me and took worms from hand. Brownie's two youngsters of brood No.1 of 1936, manes and all. I have not been keeping in touch with them during the last few days, and was surprised to find them still tame outside their usual environment. Incidentally, while they were going about together in amicable relationship, when it

came to adjudicating rights in a certain worm, a spirited fight for a few seconds resulted, in which the two birds came together face to face like game-cocks.

May 11th. to 15th., incl. (Notes written May 16th., 10 A.M., Rhody booing from the observatory tower).

During this period there has been no departure from the usual behavior on the part of the roadrunner or the thrashers. All their actions have run true to form, though some of Rhody's have become intensified. (But see last paragraph of today's notes).

Rhody's preoccupation with the magpies has increased greatly, and his awareness of them now includes reaction to their cries--perhaps certain ones only. Thus twice, ~~when~~ after having followed me to the shop for a mouse or a rat, during this period, he has heard some note from them that has caused him to depart hurriedly for the cage. On one of these occasions he sailed there taking the necessary turns through the trees expertly. Yesterday, while he was sitting quietly on the chimney, he was again responsive to a call from the cage and made a fine, soaring, down-hill flight of about 80 yards to the cage and landing about 40 feet lower than his starting point.

He visits the cage many times a day, watching the birds intently, occasionally rattling his beak, displaying and seeming to seek for points of entrance. In the aggregate he probably is spending several hours per day doing this.

Despite this he still works on nest No.5-36 and sits in it quietly, also in the aggregate for periods to be estimated in hours

Since the mouse-rat production has been diverted to his use he is relieved of the necessity of hunting for food and since he no longer hunts actively for a mate, he has a lot of spare time on his hands. While not engaged as above noted he prowls about the premises seemingly interested in the doings of other birds and everything in general--looks in the windows of the house, inspects the trees, the interior of the shop and occasionally makes short feints at Brownie and the quail, never pushing an attack home and not seeming to cause any great fear.

He knows all about 4 brown towhee nests, having visited them; at least onebushtit's , the present thrashers' and the wrentits' (when it was occupied). Presumably he knows of others, but I have not seen him at them. So far not an egg nor a chick has been harmed by him in any of these nests that I know he knows.

He has gone back to his roosting place in the oak on the west lot. I gave him a mouse at the shop yesterday evening at 6:45. This he received with the usual actions, taking it, this time, to the Scamells' dining-room window for display purposes, thence to his roost, where he ate it.

With more plentiful mouse-rat supply he is losing his taste for hamburger steak; for several days he has eaten none at all.

He has again shown his distaste for dead creatures by refusing to eat a mouse, although he had killed it himself, that had been put in his meat dish and left there about 24 hours. In the meantime, however, he had accepted two live ones. Similar behavior has been noted before. On previous occasions I have suspected that the mouse might have been rejected because of its fur having been wet, during the process of killing, by the offensively smelling urine. (This has happened). But I took such a mouse, washed and dried it thoroughly, ~~but~~ and it was again rejected.

Brownie's and Nova's present nestlings number two, again duplicating Nova's previous efforts. (Later - May 21. Three [illegible])

The first brood of the year no longer considers this place as home, but one or other of the two, on several occasions, has come out of the bushes to the west outside the fence, on call, through, under, or over the fence, climbed a 5 or 6 foot stone wall supporting the road and eaten worms from hand in the presence of visitors perfectly strange to them. In one instance: three visitors, one of them a restless small boy.

Both still have their "manes" intact.

Further in reference to the first paragraph of today's notes, there has been a change in Rhody's actions since he started nest 5-36. Up to May 6th, the notes show very clearly that he interested himself in all nests, working on them , resting in them and carrying food to them. Since May 6th., however, he has been seen to visit no nest other than No.5--with one exception. That exception was one visit to No.1, when, due to the presence of visitors too near No.5, he was afraid to approach too closely, so went to No.1.

May 16th. to 18th., incl.

During this period no departure from form was observed on the part of the thrashers or the roadrunner.

Rhody continued to add material to 5-36 from time to time and do the usual things. His behavior in sitting quietly in his nest for such long periods appears to be an instinctive carrying out of his part in what should be a time of incubation by both male and female.

May 19th.

11:00 A.M. Rhody and Brownie as usual.

A little earlier I was sitting near the oval lawn whan I noticed a California Brown Towhee loitering near me for the first time this year. I then recalled that, last year, during the nesting season, a brown towhee had suddenly shown similar interest in me without my having offered inducements, and that what it wanted was worms for its brood. (I had never attempted to tame these bird

Last year the towhee had learned, presumably by observing Brownie's success with me, that I was a source of food during breeding time and acted accordingly, with success. Since that time, no brown towhee, has ever approached me until now. I do not know whether the present bird is the same individual or not, since there are so many of them resident here, but, in any case, this bird has either just learned from observation or else has remembered its last year's experience for a whole year. I really had forgotten all about it so completely that I was surprised at first by its behavior.

Rhody refused mice all day, preferring meat.

May 20th.

At about 7 A.M. Rhody was on top of the chimney trying hard to disgorge something--as judged by A and T's actions when seen actually getting rid of an accumulation of mouse fur. He kept this up for several minutes, but owing to distance, I could not see whether he was successful. This is the first time he has been

known to make this attempt and no pellet of his has ever been found.

RR pellets.

During A and T's confinement in the cage but 10 pellets (9 only recorded in these notes(?) were found. This indicates that they represent accumulations over a long period of time and that these birds do not customarily reject the indigestible portions of their food at frequent intervals. It suggests that regurgitation with them is a matter of things not going just right.

R "off of" mice.

During the rest of the day Rhody continued indifferent to mice, preferring meat.

May 21st.

R on chimney early.

At 6:45 A.M. Rhody was on the chimney booing.

Kills mouse does not eat.

About 7 he accepted a live mouse, killed it, but deserted it to watch the magpies. At 8 he had still not touched it, being then occupied in oiling his feathers while still in the cage keeping an eye on the magpies.

There are three young thrashers.

To my surprise, I find that there are three young thrashers in Brownie's nest--a record for Nova. The error in reporting only two is due to the fact that the nest is the first one that I have not carefully examined. While it is only about six feet from the ground, there is such a mass of twigs and foliage about it that it can not be seen into easily.

B cross at nest.

11:10. I have cleared head-room about the nest and placed a box to stand on. Nova, with a cricket in her bill, scolded from a distance of from 6 to 20 feet. Brownie came and covered the youngsters, who squealed when they saw me for the first time. B was rather cross and would not take worms from me, opening his bill, threatening, but not pecking or shrinking. I have visited the last few nests very seldom, so perhaps Brownie has forgotten his former acceptance of me as a factor to be considered in the nest stage. On the other hand, it may be that the brood was well fed at the moment. Previous experience has shown that he turns to wood when that point is reached in the feeding.

Wear on thrasher bills.

About a week and a half ago it was noticed that B's upper mandible was considerably shorter, nearly one eighth of an inch (3mm.), than the lower. Now it appears of the same length, or perhaps even a shade longer.

(B comes into this room). Slipping.

At the same time it was noticed that Nova's lower was shorter than the upper by about the same amount--just the reverse of B's. I could not see any difference just now, but the opportunity was unfavorable. (While writing this note, Brownie, as if regretting his attitude at the nest, has come in here for a worm. He slips on the tile floor).(Rhody slips, but Terry did not).

Age of thrasher brood.

Brownie and Nova's new brood is about two weeks old--probably 15 to 17 days old. They rise en masse when one of their parents approaches.

First brood gone?

The first brood of the year has not been seen for several days.

B tolerates me at nest.

1:15 P.M. Just now at the thrasher nest, Brownie, who came to it promptly when Nova warned him of my approach, was pleased to take worms from me and hand them to the youngsters. He had to tap each with his bill to make it open up.

B's saliva flow.

His flow of saliva was strong. Looking sidewise through the opening of his bill as he held a worm in the tip, I was surprised

B's saliva flow.

to see a large, crystal-clear drop of fluid suspended from the lower side of the upper mandible at the highest point of the arc. As he bent his head forward to give the worm to one of the chicks the drop ran along to the tip and went with the worm into the chick's gullet. This is the first time that I have seen the saliva inside of his bill. With the next worm the same thing was repeated, and with the next (the last).

This copious flow of saliva when there are young in the nest has been recorded frequently in these notes, but, heretofore, it has been observed either as a drop at the end of the bill or as being splashed upon me.

How Rhody divides his time.

Rhody, again on the chimney top for an extended observation and preening period, has divided his time since about 7 A.M., roughly about equally among his three (at present) preferred locations: The cage, the nest and the chimney. He has not yet eaten the mouse.

Chimney now favored.

The chimney is now preferred as an observation post above all others. Next in order is the observatory roof. At the nest he "incubates" most of the time, but works a little and besides it also commands a wide view, restricted in certain directions.

Lining nest.

During the afternoon he added a batch or two of lining material--pine needles. It is a curious fact that, although he could easily gather these needles in large masses, he picks them up one at a time until he gets a load.

Departure from routine.

As a departure from his usual custom recently, he did not make a long session with the magpies his last order of business for the day, but at 7 P.M. was found in his roost in the oak on the west lot.

Factors influencing R's selection of roosts.

It seems strange that, with all of his carefully selected nest sites and comfortable nests, he does not use any of them to sleep in during the night. It is evident that none of them meets his specifications for a roosting place. There is only one feature that differentiates his three known roosting places from his 5 present nest sites completely and that is , each of his three roosting places is directly exposed to the very last rays of the setting sun, whereas all of the nests are in shadow before the sun sinks below the western horizon. This may not be, and probably is not, the determining factor. The selection is probably due to a combination of conditions. In general, the roosting places are more isolated, have more open territory about them a larger and more accessible landing fields and these fields are to the west.

May 22nd.

R goes to roof early.

At 6:55 A.M. the shadow of a large bird passing across the bathroom floor, followed by a light thump on the roof overhead, announced Rhody's progress toward his lookout post on the chimney. He occupied this post for 50 minutes, booing once.

Up again.

8:30. He is up there again, just now: rattling his beak.

B now accepts me at nest again.

Brownie has reinstated me as an acceptable provider of food at the nest. At 7:15 neither adult was there, but Brownie soon came unhurriedly, sat on the edge of the nest and took worms, most of which he ate himself. The youngsters are taking an interest in outside affairs, stretching their necks to peer at the new world. One of them uttered a "fear squeal" when B arrived, but had not shown fear when seeing me approach a few moments before. This accords with previous experiences.

Nova has "mane".

A little later (8:15), as I approached the thrasher nest, one of the adults, assumed to be Brownie because of apparent lack of fear, was sitting on the edge and seen in profile against the bright sky. I was surprised to note that it had a "mane" like that of the youngsters of the first brood of the year, but not so pronounced. When I took of my hat to avoid branches overhead and get a closer view (4 feet), the bird made a peculiar sound and I saw that it was Nova. She left, but not in much fear.

Is the "mane" of the first brood inherited from Nova?

R still uses large twigs at 5-36.

At 9:05 I looked up Rhody and found him carrying large twigs up to 5-36. He was using them to build the outside wall higher. He soon came down for a session with the magpies.

Argentine ants at thrasher nest.

At 9:15 B was sitting quietly on the edge of the nest. An ant, disregarded by him, was crawling on his bill. Others were about the nest, but not many--the first seen at this particular nest. The nest has not been fouled by the brood at all and at present there seems to be no reason to suspect that these insects have any designs upon the chicks, but they will be watched and poison (safely enclosed) placed at the nest. Due to interlacing branches, it is impracticable to protect the nest with "tanglefoot."

But see later re feeding

Time for young thrashers to leave nest?

The young thrashers should be about ready to leave the nest, and I shall not be surprised to have this happen at any time now.

First thrasher chick leaves

10:04 I saw one of them just leave the nest. Since 7:15 this morning, when only one chick was fed by B, the parents have not been seen to take food to the nest. I have thought that withholding food, on previous occasions, has been one of the means adopted by the parents in encouraging departure, though I doubt if there be any conscious effort on their part, of any kind, to induce this action. Certainly none has been witnessed here.
(See later note)

No training of young thrashers by parents.

Except for shadow boxing perhaps, no "training" by the parents at all, in any of the activities in which birds are concerned, has ever been seen here, if my memory (without reference to past notes) serves me. This applies to leaving the nest, first and all subsequent flights, finding food and drink and getting it down. Some guidance is given in selecting roosting places at first, but it is doubtful if this can be called training.

B feeds those left in nest.

At 11:15 Brownie came to me for worms, taking three to the two chicks remaining in the nest. He would not take any more.

The one that left is not visible, though Nova appears to know where he is. If so, she nevertheless leaves him to come and scrip at me when I approach the nest. This one has not been heard to call as yet.

11:30. Brownie showed me the youngster by coming to me for worms with which to feed him. He is only 15 feet from home down in the bracken and penstemons.

At noon he had moved about 50 feet toward the oval lawn and was under a flat-growing azalea. Brownie came for worms and looked for him, but could not find him although he was within my reach, so he took the worms to the nest.

There is evidently no mysterious sense by which thrashers locate their young and unless the latter are in plain sight, or call, the supposedly keen eyesight and sense of hearing are of little aid to them. As has been shown in previous instances,

even when the young birds call, the parents may not be able to locate them exactly and may even look for them in a direction opposite to the proper one.

At 1:45 P.M. Rhody seeks the shade and the breeze in which to rest. Temp. 80. He still does not want mice.

Nest foul.

7:10 P.M. The 9:15 note states that the nest had not been fouled. Examination at 5:30 showed that it had been fouled, perhaps since that time. With the exception of the October--November nest of 1934 this is the first fouling noted of a thrasher nest, and indicates something not just right with the youngsters (as in 1934) or perhaps delayed departure, since, as has been noted the excrement becomes more fluid when the time to leave approaches. As a result if departure does not synchronize properly with this change the parents are not able to dispose of the excrement properly.

2 still in nest.

Two youngsters are still in the nest.

B still feeds these two.

Referring to note of 10:04. Brownie did not withhold food entirely during the afternoon. He stuffed both chicks well on one occasion with my help, and fed them more later, although most worms were eaten by him.

Coues' Chicken-Magpie.
R also has dog-cat characteristics, as witness:

Coues characterizes the roadrunner as a singular bird : "A cuckoo compounded of a chicken and a magpie." Rhody also combines with this dog and cat characteristics. Truly a singular bird, as witness:

About 4:30 he sailed down from nest 5-36, came back to me, lowered his head and whined pathetically. The answer was worms. These he caught as they were tossed to him. The whine (or mew) may be either cat or dog. The catching is dog.

R still-hunts.

Victory.

A slight variation from form.

Dog-like trampling

First bad landing.

Thinking he might now accept a mouse, I got one for him. He was not interested until the creature crawled under a rock. He stood by, doglike, watching while I tilted the rock. When the mouse ran away he merely followed it watching it curiously until it disappeared under a manroot vine (Echinocystis). He wandered off to the glade for a drink. There he heard something that called him back to the manroot where it spread out in a broad curtain over the bank that forms the northern side of the road. He crouched, perfectly quiet, for a half hour watching the vine intently. (Still hunting, like a cat). He gave up, came and stood in front of me, facing me and whined. Suddenly he was off like a shot. A lizard (probably from under the manroot) had darted away full speed. Rhody, handicapped by 20 feet, had him in 30 feet. He brought him back and dropped him in front of me, then started to walk about him in a circle (cat). When the lizard tried to bolt R had him instantly. Then followed a bowing and tail-wagging march to the west for 120 yards, with occasional hroos and glances up into the trees. He then reversed his course. When half-way back he went up 20 feet in a pine, walked out a limb that overhung the road, squatted on a bunch of cones and ate the mouse. The location suggested nests, so he moved twigs with his bill and turned about, dog-like, to trample others into an elementary sort of resting place (dog). Here he rested for 15 minutes, then crawled back to the main trunk, broke off dead twigs and dropped them to the ground, then sailed down to the road, with the wind, making the first bad landing I have ever seen him guilty of, in consequence;;trotted to the cage 8o yards away. When I got there he was already installed in his armchair-shelf looking

pleasant and gentle, but hoping that the magpies would come close enough so that he could deliver a pulled punch at them . Truly a singular bird, with both cat and dog characteristics.

May 23rd.

Extraordinary Behavior of Brownie

At a little after 7 A.M. it was noted that all the young thrashers had left the nest, and from the sounds, were being attended by their parents.

B returns to vacant nest.

Ants.

Shortly after Brownie was seen probing with his bill in the bottom of the deserted nest. When I went there he settled into it firmly. It was swarming with Argentine ants and he was watching them and picking one up now and then.

All over him.

I help him.

He resists.

Gets angry.

Pecks and pinches.

Determined not to leave nest.

Soon they were all over him, even crawling on his eye-balls. He tried to rid himself of these by closing his lids. In one eye there were two ants. I went to his assistance and took him out of the nest using as little force as possible. He resisted and held on to the nest. At last he took hold of my fingers instead with a firm grip. We got rid of most of the ants on him. He assisted by picking them off of my hand, but he pecked me also. He popped back into the nest and the ants were all over him again. This time I could not get him out without hurting him, and he became very angry, pecking me with all his strength and selecting tender places, like the webs between the fingers, to pinch and hold on to. He is a silent fighter. He would not let go and permitted me to do anything I pleased with him rather than leave the nest.

I lift him out.

Back again.

I finally lifted him out bodily. (He had never been treated so roughlly before). I covered the nest with my other hand before he could get back into it. He straddled that hand, picked ants off of it and peered down around it into the nest. He now became very calm. I withdrew the hand. He immediately settled firmly in the nest. I shook it to dislodge ants and to see if B would get out. "Nothing doing". He intended to stick in that nest whatever might happen to him. I placed another tin of ant poison in a strategical location on the nest and left him.

Still there an hour later.

At 8:05 he was still there on guard watching the ants crawl in and out of the interstices in the nest and the poison receptacle calmly. Most of the ants were now occupied with the latter and he seemed free of them. I came in to write this note. I hear him calling now (8:30) and will go out to have a look at affairs.

B bears no ill will.

8:35. He was not at the nest, but discovered me at once and came without hesitation for worms from hand as confidingly as ever, my late rough treatment of him having left no sting. He carried the worms off to one of the brood in the fern nearby.

Explanation?

This incident offers all sorts of ground for speculation, but it seems evident that Brownie's actions were inspired entirely by an instinctive desire to defend the nest and that the departure of the brood was so recent that his mental faculties had not had time to readjust themselves to the new state of affairs, where this protection was no longer essential. It seems to be a case where instinct ruled entirely and the bird's intelligence was not of a high enough order to prevent his engaging in such a futile performance. On the other hand, it might be that he actually remembered his November 1934 experience with ants and was inspired thereby to battle for his lares and penates, though seems highly improbable. (End of this note).

R begins to report at mirror empty-handed.

9:30 A.M. Owing to preoccupation with Brownie and his affairs I gave little attention to Rhody and his. As a result he was not seen until 9 A.M. when he sailed down from the top of the cage, trotted to me and took worms from hand. Following this, he reported at the mirror, empty handed--a habit now increasing on him--for a second or two without display, thence to take a twig to nest 5-36. After this a visit to the magpies. As intimated, he now "reports" occasionally to the mirror for one or two seconds at a time, going out of his way to do so. There is no display of any kind; it is as if he just wanted to see if it was still there.

Brownie follows me and calls.

On my return to this room Brownie followed me and called to me from a tree near the door--object worms. There can be no doubt of this bird's calling me at times. I have had abundant examples of it.

Nova becomes vocal again.

Suggesting Bullock Oriole.

After the first youngster left yesterday it was noticed that Nova began to sing at times. This morning it was still more noticeable. If I did not know it was Nova, it is possible that I would not recognise it as thrasher music at all. In timbre it suggests the Bullock oriole, though not in rhythm nor in phraseology.

R reconsiders mice.

R a singing butcher.

At 10 A.M. Rhody, presumably having cleared his pipes of accumulated mouse-hair as a result of several days' abstinence from mouse-meat, viewed the matter with renewed interest, took the proffered animal, treated it to the usual honors, including presentation at the mirror, thence to the nest, where he ate it with soft, sweet coos. Imagine a butcher, standing in a shambles, singing love-songs while he pole-axes a steer! A strange creature, Rhody.

May 24th.

Mice in favor with R again.

Rhody has fully recovered his appetite for mice, twice today following me happily to the shop yard and waiting patiently until I secured a victim. Once he did not visit the mirror, otherwise the usual ritual was carried out and the mouse finally eaten in nest 5--36.

Building material to mirror.

He was seen to present building material at the mirror three times as a preliminary to placing it in the nest.

B ignores old nest.

Since 8:05 yesterday Brownie was not again seen at the ant-infested nest.

Nova quits singing.

B begins again, different style.

Nova did not continue her song cycle, but Brownie took up where she left off, singing from the old oak frequently all day. All of the songs were short, perhaps 5 or 6 seconds in length, and at irregular intervals. They mostly repeated the same set of phrases over and over again--not usual with him, and were of peculiar, variable timbre (within any one song). It did not sound like Brownie and I had to verify the fact of his being the performer.

Copulation at unusual period in cycle?

About 5:30 P.M. Nova approached the base of the tree while he was singing, making inarticulate sounds, and Brownie suddenly dived down and performed the act of copulation. This was unexpected at this stage of the nesting cycle. Perhaps it means another brood to be reared and a nest already under way.

May 25th.

10:05 A.M. B seems to have abandoned his spurt of song.

Rhody has had his first mouse of the day, following me to the shop for it and carrying out his ritual in full detail.

He had a second mouse about 3:30.

Variation in Rhody's mouse reactions.

When invited to the shop about 5:50P.M. he followed me readily and waited for me to produce the mouse. When it was placed before him he made as if to take it, changed his mind and backed away from it inreal or simulated fear when it approached him. He then waited for me to do something else interesting. All I could think of was another mouse, since I had given him worms a few minutes before. Accordingly I put another one before him. He followed first one and then the other without attempting to catch either. Finally one bolted at full speed, and this stirred Rhody to action. He dashed after it, but really did not try to catch it and allowed it to escape. He then went back to watch the magpies.

Explanation?

This behavior is somewhat puzzling. It is at least clear that he did not want mice. Also he had had all the worms he wanted. Consequently he was not hungry. But why did he follow me to the shop if he wanted nothing from me? I do not know, especially as this is the first incident of the sort. Possibly for amusement, or on account of curiosity, or maybe following me when I call him is becoming a matter of habit.

B feeds only one chick.

Brownie has been having a very easy time of it since the young birds left the nest because he is feeding only one chick. Nova, I suppose, is taking care of the other two, though I am not sure that I have seen them all.

Today, the one B feeds, stayed in precisely the same roost from 9 A.M. until 3 P.M. "resting" quietly. It may have been longer, as I did not get his arrival and departure.

May 26th.

I find a wild roadrunner at Lake Chabot.

About 10 A.M. I was driving along the road that skirts Lake Chabot when I saw a roadrunner in the road about 25 yards ahead. It was not frightened apparently, but walked slowly toward the heavy growth by the side of the roadpermitting me to stop the car within about 15 feet of it without quickening its leisurely pace. It looked smaller than Rhody. The speedometer read 10.9 miles (by road) from here. The bird went through the barbed wire fence and stopped under the branches of an elderberry only 2 feet from the wire. I got out, spoke to it as I do to Rhody and it allowed me to approach within about 12 feet without appearing to look at me at all. (A typical trick of Rhody, Archie and Terry). It then moved into the dense underbrush slowly and with no sign of fear whatever. No more than Rhody does when he just wants to go somewhere else.

"Tamer" than Rhody in some respects.

Comparison with Rhody.

Rhody is afraid of an automobile in motion at these distances, but this bird was not.

Rhody will run away in a panic when he sees strangers nearby. (Sometimes when they are 100 yards away).

This bird did not run away from a stranger. (As I assume I was, though naturally the thought occurred that it might be Archie or Terry--and maybe it was).

A paradox.

Here is apparently a case of a wild bird's not being afraid of the things that a tame bird (Rhody) fears! I wonder!

I movedon, as I was not prepared to follow through the dense chaparral, and saw the bird no more, though I called and got my supply of worms ready!

On my way back about 5 P.M. I stopped at the same spot, but saw and heard nothing of roadrunners.

Contrast this with wild road-runner behavior.

(R more frightened of strangers than wild one was of me).

At 5:30 I found Rhody in his nest here, spoke to him; he whined, came down, stood 3 feet from me and caught worms on the fly--perfectly without fear. Yet suddenly he crouched low to the ground looked intently beyond me and headed for cover in the opposite direction, plainly frightened. The cause: Three boys down below in the street, walking quietly in our general direction at the moment, about 75 yards away. Yet Rhody was frightened; they could not possibly see him through the trees. I was not able to find him for about 10 minutes. He then reappeared 50 yards away to the west from behind the house, trotted after me dutifully when I went to the shop, but paused to listen every few feet. (Compare this with the attitude of the wild bird towards a stranger)

Another variation in shop-mouse pattern of R.

Rejects large mouse but accepts small.

At the shop I offered Rhody a mouse. (Later I learned from Julio that he had killed one a few minutes before, but would not eat it, and that he "must have been away all day as I could not find him"). Rhody reached for the mouse, but as late yesterday, drew back and waited for something else to happen. This time, it occured to me that perhaps the mouse was too big, so I got him a smaller one.(They are all alive). That was what he wanted. Then followed the ritual, complete in all detail, including display of his trophy at the mirror and ascent to the nest.

Still works at nest.5--36.

He still works a little at this nest, 5--36, and ignores all the others.

May 27th. to 29th., incl.

During this period there were no new developments. Rhody continued to add material to the nest at intervals.

May 30th.

Time at which B begins early song

At 4:45 A.M., a few minutes before sunrise, Brownie was heard repeating his purple, one, two three call over and over again as if to summon his family.

B in nest early.

At 5:30 A.M. Rhody was found sitting quietly in nest 5--36. (I was absent during the rest of the day).

May 31st.

B moves brood away.

Brownie was found to have moved his latest brood down to the west lot. I could not find any of the thrashers at about 8 A.M., so went to the west fence and whistled B's call . In a few minutes he came, got worms, took them down into the lot and did not return for more. I could hear the youngsters there.

Rhody as usual.

June 1st.

B and brood still away.

Brownie and family remain in the thick undergrowth of the west lot.

Rhody takes twigs to pine.

Rhody continues to add to his nest, visits none of the others, but twice took twigs up into one of the pine trees, placing them in different locations.

During the last few days he has taken to going to the shop on

Rhody watches rats without lesigns on them.

his own initiative in order to watch the rats and, at the same time to satisfy his curiosity about the other things there.

Once he was observed standing upon the rat cage watching them but not offering to molest them. When one of them sniffed at his feet he merely lifted and spread his wings and peered down at him.

Rhody cutting capers.

He is now beginning to renew his trick of dashing through the bushes in loops, circles and figures of eight, with spread wings and exaggerated postures. He is interested in other birds; follows then but does not attack them.

June 2nd.

ore capers by Rhody.

At 9 A.M. Rhody was having a lot of fun in the west lot going through his ridiculous evolutions in an area along the south side where the bushes are scattered, with open spaces between. This time he pulled branches off of the bushes, picked up loose objects and carried them with him in his flight, dropped them for others and made short dashes in the direction of wrens, wrentits and Nuttall sparrows that were interested in his gymnastics; but he always stopped short of them. All of this was accompanied by beak rattlings and soft boos. During resting periods he came to the bank near me, but wanted no worms and apparently did not even look at me ten feet away. Finally he left to return here and I went on an errand.

Rhody attempts too large a mouse.

Returning at noon, I found him ready for mice again. I gave him a very large one. He killed it at once, made no display, tried manfully to swallow it, but had to give up and disgorge it. A young rat was substituted with better success, but here was no display of any kind.

R's mating instinct waning?

This last episode, together with his renewed clowning and carrying of the two twigs to the pine tree, made me wonder if his reproductive urge might be on the wane, since his actions appear now to be somewhat less directly concentrated upon his nest--more diffuse and random. However, just now (2 P.M.) after a session with the magpies (who almost completely ignore his antics) he gathered a large sheaf of pine needles inside the cage and carried them to 5--36.

B and brood stay away.

Brownie and tribe continue to remain away from the premises, but can be heard at times in the west lot.

June 3rd.

B in fine early song

At about 6 A.M. Brownie perched on the roof near my bed-room window and sang beautifully using many of his old-time phrases that I have not heard for several(?) months. This notwithstanding a fairly heavy, unseasonable rain was falling.

B bringing brood back?

Neither he nor his brood was seen on the premises later in the day until about 7:30 P.M. (Sunset 7:26). At that time I heard him in a very unusual place for him: in the oaks near the west living-room window. I went out to investigate. He had one or more of his brood there and was pathetically eager for worms to give them. I could not tell how many he was feeding; the youngsters (if more than one) were moving about from place to place seeking roosts, and B, in consequence, was in and out of various trees. It was noted that his own movements were not nearly so certain as in broad daylight, both in the trees and in alighting upon my hand from the branches above. Twice he made as if to land upon my head, showing since he never does this, uncertainty of making a good landing on a smaller object; but each time he banked and went to my hand.

B pathetically eager for worms

B's uncertainty of movement in twilight.

Talkative.

He was unusually talkative while getting the worms, sounding much

like a young bird.

Thrashers have not been known to roost in this particular group of trees before, nor, in fact within 50 or 60 yards of it. Also taking the young birds away from the place and keeping them there is a departure from previous habit.

Rhody takesa rat to 1-36.

Rhody behaved as usual, with one exception, and that is, he took the first young rat of the day to nest No.1--36 instead of 5. The second rat went to 5, preceded by the usual formalities.

R's ritual strongly resembles an expression of gratitude.

This is an extremely interesting performance, but unfortunately, one which he will not exhibit before persons whom he does not know. I can only show it to others, therefore, through the medium of the motion pictures. If I had not previously observed that it forms an essential portion of his courting behavior and is seen only during the mating season, I might easily have been deceived into the belief that it represents an expression of gratitude for benefits received! It most assuredly looks like one, and a very complete and satisfying one to the donor.

Major Brooks' Road-runner Painting
in Nat'l. Geog. Mag., June 1936, Vol.LXIX, 6

Critical examination of this illustration gives rise to the following impressions, using Rhody, Archie and Terry as standards of comparison and not presuming to question the accuracy with which the drawing portrays the model used, or, for that matter, road-runners in general. But, in order to avoid circumlocutions and for convenience, those birds will be considered here as faithfully representing the typical road-runner. Allowing for difference in ages and possibly sex, they are substantially all alike in appearance.

1. The first impression is one of strangeness. Here is a new type of road-runner not seen by me before. A short, heavy bird with something "chickeny" about its head.
2. I see what the chickeny effect is due to:
    a. The yellow ring about the pupil is too wide and it should be thinner in front than in the rear. It is the eye of a domestic fowl.
    b. The bill is too short and too slight.
    c. The crest is too "solid". In reality it is loose and when erected as this one is, the longer feathers do not touch each other at all for perhaps half their length.
3. With the exception of the bare skin back of the eye, the coloring is by far the best I have seen in any portrait of a road-runner. It is amazingly good, especially bearing in mind that the colors seen vary with the angle and the intensity of the illumination and the angle at which the bird is seen, i.e. in the living bird.
4. The skin patch differs in form, extent and color from our assumed typical bird. Our type has a pure white acute isosceles triangle based at the rear of the eye, with blue above and below.(Unless fully displayed, the lower blue does not show). The white triangle merges into the two blues through intermediate blue-white, light blue, etc. in our type, and is separated from the red (Scarlet?) by blue-white. The red extends clear around to the back of the head, and nearly meets its fellow in the living bird and shows plainly from the rear. It also extends downward, so that the shape of the fully displayed patch is roughly like that of a wide carpen-

ter-square. (There is reason to believe that there is some individual variation in skin patches, although I do not know whether females differ from the males. Immatures do. Also, since the skin is of crepe-like texture and may be stretched nearly smooth and taut when the bird is excited, there is variation in hue to some extent in any one individual. Perhaps also due to other causes)

5. The neck looks too thick and heavy , but it must be admitted that, in courting season, when the bird has prey in its bill and is about to bow and hroo, the neck does appear short and heavy during that action, although the feathers at the back of the neck then usually part somewhat. This "thickness" then is but a momentary phenomenon, in my experience.
6. I have never seen a road-runner turn one foot out at an angle to the other as shown. This looks strange, although it may be correct. In any case it is an unusual posture.
7. The tail looks much too short. (Rhody's longest tail feather was found to be 12¾ inches).
8 The gape extends all the way back to the eye in our type. (In fact to a point below the eye).
9 For an inch or so below the ear coverts the pattern of the streaks seems to me to be too nearly parallel to the neck in the picture. In our type there is distinct horizontality as if the feathers had been brushed back, with a decided whitish moustache effect from the gape.
10 In a bird so finely detailed, the eyelashes , I think, would show.
11 The streaking on the breast is more pronounced than in our type and the belly browner . Both areas are much less flaxen than in the living bird, but the hair-like appearance of the plumage of the under parts is rendered with extraordinary fidelity.
12 The legs seem to be too far forward and the tarsi rather thick.
13 Going back to the head: The living bird is more "careless" about its head-feathers.

(Compare the Finley photograph of a roadrunner, page 76 of the Book of Birds, Natl. Geog. Soc., 1925 Ed.--a splendid likeness. Also Fuertes' caricature p.45 of the same book).

June 4th.

B's early song.

Brownie's song, coming from the west nearby, was first heard at 4:25 A.M., the earliest yet.

One youngster back.

At 7:30 A.M. he had one of the young birds back in the garden. There is a decided tendency at present for him to occupy that portion of the garden west of the house.

Rhody still works on 5-36.

At about the same time Rhody was "incubating" in nest 5--36. Later, and at intervals throughout the day, he resumed work on it, sometimes getting material from inside the cage. A hanging rope forming part of the gear of the awnings of the cage, has attracted him during the past few days and he has repeatedly tugged at it as desirous of using it as part of his structure. Yet a piece of rope yarn placed near it, though occasionally picked up by him, has not been used.

At sunset Brownie had one of the youngsters in the hedge west of the house and again was especially vocal in taking worms from me. Nova and her charges were not located.

June 5th.

B's early song.

B's early song, again from the west a few yards away, was heard before 5 A.M.

B's whole family home again.

On returning about 10 A.M. from an errand, Brownie, Nova and more than one of the youngsters were in the trees close to the west living room window.

An apparently intelligent act of Rhody's.

Rhody was on the chimney at this time, and when I called to him, sailed down toward the shop-yard. When I went there he was already waiting for me to get him a rat. This shows ability to omit one link in the chain of this rat-feeding pattern (the following me part) and proceed directly to the crucial point.

R unexpectedly sings again.

The usual ritual and devotions at the shrine followed, and carrying to 5-36, but there there was a diversion from form, for, to my surprise, he began to sing his cooing song for the first time since a record of it was made in these notes. He kept this up for 5 minutes, then came down to sun his back.

This song, as has been repeatedly pointed out, is sweet and sad with a decidedly pleading quality. When one has not heard it for some time, although often having heard it before, there is still an element of surprise that such a song should emanate from so large a bird.

R unusually hungry.

After sunning himself a few minutes he still-hunted a lizard in a woodpile without success, then to the cage for meat. He is hungry this morning.

R and his favorite lizard.

About noon he was crouched outside the cage waiting to snatch the resident lizard there. Again without success.

At 2:15 he was back at the woodpile on the same errand. The cage lizard was in plain sight 50 feet toward me from Rhody and behind me. I went around to the far side of the cage, putting it between me and the bird and then called him. He deserted the woodpile and trotted toward me. He could not forego one vigorous tug at the rope as he passed, and that alarmed the lizard, so another chance was missed. However, he trotted to the shop behind me and there was rewarded with a young rat, for which he whined with chin almost touching the floor.

June 6th.

B's early song in rain.

Raining about 4:30 A.M.--one of our infrequent rains in June. Brownie was singing at this time in about the same location as yesterday. I left at 5:50 A.M. and was away the whole day, returning about 6 P.M. (With Mr. C.H.Feltes in Lone Tree and Hospital Canyons looking at the Texas nighthawk nests of which he had located 10 previously in Lone Tree Canyon and 4 located by the two of us in Hospital. At 4 P.M.--no sun--15 ft. of film, bird on nest, dis. 6 ft. to 2 ft., first 10 ft. f2.8, last 5 f1.9).

(Nighthawks).

June 7th.

B singing 4:20 A.M.

B singing at about 4:20 A.M., same place, moved to old oak, judging by the sound. It was found that the youngsters had been brought back from the west and one or more were in the the glade or nearby. B feeding only one. Nova, presumably the rest. She gets suet for them at the oval lawn.

Youngsters in glade.

R eats 2 rats without ritual.

Rhody had two young rats today, eating them without going through any of his ritual. If he continues thus it will seem to indicate the waning of his mating instinct for the season. (?).

The second rat was given him immediately upon the departure of two visitors about 5:30 P.M., from whom he had hidden, coming out when they had gone and finding me himself at the shop.

June 8th.

R losing interest in mating?

During the day Rhody had two rats, both of which were eaten without ceremony. He has been away during the middle of the day several times now. These may be indications of loss of interest in domestic affairs.

June 9th.

R eats rat without ritual.

I was away (at the nighthawks' nests) from 5:50 A.M. to 5:15 P.M. Julio says R had one rat which he ate without display, and that he seemed to be away most of the time; but he was here as I drove in to the place.

After a bath and a change, I sat outside for a time. Brownie, Spots (the spotted towhee with young), and Scar-face (the brown towhee--who also has young), came and found me successively, on their own initiative, to get worms.

June 10th.

R eats mouse with display. Curiosity?

Rhody had a mouse at 7:30 A.M. with display again.

About 6 P.M. he accepted my invitation to come to the shop and was interested in the various mice and rats I got out for him, but he seemed to be puzzled as to what I wanted him to do about them, since he was not hungry. He was willing to crouch and peer under doors and gates when they crawled under them, but seemed to feel that he had discharged his obligations as a guest after he had admired them and preened between offerings. Eating them was not to be considered. Curiously, at dinner time, I happened to look out a window, and there was Rhody with his bill against the pane looking in, like a child with its nose against the glass of a toy shop. However, he did not come in when invited.

It looks as if his motives on these occasions were merely curiosity or a desire for entertainment, or perhaps, company.

June 11th.

R adds lining to 5-36.

A hot morning.

At 8 A.M. I did not see Rhody on the premises, but at 9 he ran quickly out of the interior compartment of the cage with a large sheaf of pine-needles in his bill. These he took directly up to nest 5-36 with such haste as to indicate a sudden and pressing need for them there!

June 12th. to 14th., incl. (Notes written on the 15th.).

During this period there were no changes of consequence on the part of the thrashers and road-runner.

B. Nova and brood home again. Young thrashers solicit little for food.

Brownie, Nova and the brood (though I am not sure that I have seen all three young birds) appear to have returned for good, or, presumably until they are chased away. They have now been out of the nest three weeks and are big and strong, yet their parents feed them constantly. Like all young thrashers, they solicit very little for food and seem to expect that, by remaining more

or less in the same spot indefinitely, food will be brought to them. And that is what happens. As a rule they do not even advance to meet their parents when they see them bringing food, even one step. Usually, also, they are pretty capable of taking care of themselves before they assimilate the fact of my being in some way hooked up with the food supply. Thus Brownie's special charge, for the first time, on the 14th., came to me with his parent.

Nova feeds her bird (or birds) suet extensively.

Rhody's present pattern.

Rhody continues to do all the regular things appropriate to the occasion, following out his recent trend of displaying less when given a mouse. (I.e.: less often displaying). Roughly, now, I should say that he goes through the ritual about half the time. He still roosts in the oak west of the house at night, uses nest 5-36 to rest in, adds a little to it now and then, retains his interest in the magpies, likes to preen in the cage for many minutes at a time, continues to lay unsuccessful siege to the lizard resident there, investigates the cause of disturbances amongst the other birds and inspects all new creations of mine in and about the property.

R and magpies.

About 5:30 P.M. on the 14th. I was letting the magpies reach through the wire netting for pieces of meat held in hand. Rhody, seeing a good opportunity to observe them more closely, flew up to a handy perch and sat a foot from my hand watching intently, with bulging eyes and skin colors fully displayed, crest raised. It has been noted herein that this skin is of crepe-like texture, b but that it can be stretched out smooth: "tightened up". This was very noticeable on this occasion. He did not attempt to peck either magpie, but kept his bill pointed at one or the other of them as they moved about, and "popped".

R "pops".

R's manner of looking at object.

He looks directly at an object in which he is intensely interested most of the time, although he may use first one eye and then the other, but not on this occasion.

This "pop" is a single snap of the beak, not often heard. IT is not a click, but a rather resonant pop.

June 15th. 1936

Gopher-snake eats mouse.

Julio caught a gopher-snake at the kitchen door and caged him temporarily. This creature will be used to amuse Rhody in front of the movie camera (I hope). I gave him a live mouse. He was awkward and slow in catching it, but when he once had a grip on it, with lightning rapidity crushed it between folds of his body--not in his "coils"--retaining his head-hold at the same time. He uses this fold as a "hand" to hold the mouse while he is trying to push his mouth over the mouse's head. He continues to hold the mouse in this way until it is fairly well down his gullet. From the time he got his first teeth on the mouse until it was about one foot on the way down, about 15 minutes elapsed.

Rhody as usual all day, including adding to nest 5-36.

Length of Rhody.

A "big" bird.

When he stretched out in one of his spread-eagle sunning poses by my chair in which he lies flat on his belly, with tail, neck and bill all flat on the ground and in a straight line, I marked his two extremities with matches stuck in the ground. When he got up, the interval was measured and proved to be 24¾ inches (628 mm.). (Hoffmann: 20 to 24; Pearson in "Birds of America: 20 to 24; Dawson: 21 to 25. Rhody, then, would appear to be above the average and near the upper limit).

June 16th.

No display by R for 2 mice.

Rhody did not display for either mouse given him today and spent his time on the nest, in the cage preening or watching the magpies, on the observatory roof, sunning on the ground or investigating the cause of excitement amongst the quail (a cat), until noon.

Rhody absent.

After that he was not to be found anywhere during the rest of the day, including all of his known roosting places long after his usual bed-time.

Young thrasher getting bold.

When the young thrasher that Brownie is feeding sees his parent approaching me, he comes too; in fact sometimes anticipates B's arrival. Thus, once today, he flew almost into my face from a bush 15 feet away, shifting his course suddenly as I was about to duck and landing behind me before B had reached me.

I scarcely see the others--never both together, but Nova is attending to them (or it).

June 17th.

Rhody still away.

Up to 11:15 (this moment) not a sign of Rhody about the vicinity in any of the places where he was almost certain to be usually. I suppose he is off on one of his very infrequent expeditions out into the world.

"

1 P.M. Still no Rhody. I hope, but do not expect, it will turn out that he has located a mate and is endeavoring to persuade her to come here and occupy one of his many mansions.

"

4:30 P.M. Still no Rhody. This is getting serious!

Back again! R indifferent

Reason for R's indifference.

Incorrect theory

6 P.M. On returning at 5:30 I found Rhody by the cage. He was perfectly indifferent to my coming and showed no signs of recognition--somewhat to my disappointment. I got him a mouse, but he was not interested. In 15 minutes he went up to the nest and did not even whine. As I was attempting to formula some theory to account for his lack of enthusiasm, it occurred to me to ask Julio if he had seen him and fed him. He had--both--at about 5 P.M. A young rat, which he gobbled at once. My tentative theory, as far as it had advanced, was that he had stuffed himself with lizards while abroad.

June 18th.

Rhody on job and finds me.

He comments on my catching mouse for him.

No display.

A typical act.

R and towhee nest.

At 8:30 A.M. I went out to look up Rhody to see if he was still on the job and ready to acknowledge my existence in case he should see me. I could not find him at first--in fact, did not find him literally--as he found me and was pleased to follow me to the shop-yard and watch while I "dug up" a mouse, "muttering" softly. (I.e. he rattled his bill barely audibly and "blew" at the same time). There was no ceremony with this mouse. A squeeze, one slap on the ground, and it was on the way down. Rhody examined the ground about his feet as if to see whether he had overlooked anything (a common action of his), stretched out a wing and a leg on the same side, then climbed up to the observatory tower to observe the affairs of the outside world from that point for the mext hour. For the next half hour he was out of sight somewhere, but when Brownie began to sing from the old oak, Rhody came trotting up the road from the street as if in answer to the thrasher. He climbed the adjoining tree instead of joining B. In this tree there is a towhee nest. So, thinking I might catch him in flagrante delicto, I stole up carefully. He was about 6 feet

from the nest preening innocently. Brownie came down and stood at my feet expectantly. Rhody saw him and also came down. B moved off. Rhody, as if in disgust, bolted with extravagant gestures for the nearest drinking place. His thirst quenched, he next walked and tapped upon a window-sash placed over some seeds. (His reflection?). Next in order was a prolonged spread-eagle sun-fit, it being too warm a morning for the hollow-bowl type. I left him there, apparently a perfectly dead animal, about 10:30.

Speculation on R's recent behavior.

and 5 new nests

His late absence has not been accompanied by any revival of behavior previously associated with mating instincts. It will be noted that his interest in mice has become increasingly less "idealistic"--more strictly utilitarian. It may be that, when away, he really was in search of a mate, but, on the other-hand, it may have been an indication of actual fading out of the mating urge for the season, in that, temporarily at least, he abandoned all of those associations at this place (magpies, mirror, former abode of his off-spring--potential mates) which, undoubtedly, in addition to food and water resorces, tended to attach him to this specific environment. His going away, therefore, may be a manifestation of the tendency of road-runners to roam after family affairs of the season are either completed or abandoned.

More frequent absences to be expected from now on ?

If such be the true explanation, it is to be expected that more frequent absences will occur from now on. (Unfortunately the same thing will occur if he has decided to look further afield for a mate, and only actual trailing of him--as last year--can determine which hypothetical motive is the true one).

Experience with Nova's young bird.

Attempt to gain his confidence--the first

12:15 P.M. I have just had an interesting experience with the young thrasher that Nova is attending. About 12 I noticed a thrasher in the bushes across the oval lawn, about 30 feet from where I was sitting. This bird I thought was Nova's. Soon, on her appearance near him, it proved that he was. Nova left and I determined to see what could be done about gaining the confidence of this bird. (I.e. the young one). Now I have never, in any way, attempted even to attract the attention of this youngster and Nova, as is her custom, scrupulously avoids me and there is no possibility of any of her specific charges learning from her that I am a source of food, to be trusted. Such teaching as this bird has had from its parent, if any, has been, as regards me, one of avoidance.

A short fully mature full-song.

He has mane also.

First: I sat quietly watching. The bird moved nearer me by perhaps five feet, still in the bushes. It gave its baby call: yip. A lawn sprinkler was playing on the lawn between us. The space occupied by the lawn is one which thrashers (see past notes) are usually fearful of crossing, as hawks raid it. The yip was repeated but, surprisingly, ran off into a veritable thrasher full-song of excellent mature quality, but only about two seconds long. (A male? The one that left the nest May 22? He has a "mane" too, like his two elder brothers(?) of the first nest of the year, and also like the one Brownie is now attending; this last noticed, but not recorded).

I toss worms to him.

Bathing reaction

I began tossing worms toward him. Try throwing a worm only one inch long, a distance of 25 feet, at a wild bird, and make no movement that will frighten him, when he is watching you! Well, he did not budge. Then he came down and got one worm and began edging around the circumference of the lawn near the bushes, passing through the outer edge of the sprinkler spray. This phenomenon surprised and interested him. He made a few symbolic bathing movements when struck by a drop or two. I "lead" him with another worm as a sportsman leads a flying bird with a gun. I continued

Less fear of e than of anothe bird.

doing this, working him around the spray toward me. Some of the worms he got, some not. Occasionally he flinched slightly at my movements or retreated, but advanced again. He approached me within 6 feet in the open in the hot sun, on the bare road, and picked up worms. He suddenly fled in panic when a spotted towhee, eating suet 15 feet away, flew. He was not afraid of me any more than he was of that bird. Apparently less so. Observation ended here. Duration about 15 minutes.

Reasons for thinking that wild birds have no inborn fear of man: as an.

From this experience, taken in connection with many others with thrashers here and in the wild, with road-runners here and one in the wild, with wrens and the two kinds of towhees here, a Virginia rail here, black-headed grossbeaks, orioles (Bullock), green-backed goldfinches and other birds elsewhere, I am satisfied that the wild bird has no in-born, inherited, innate, intrinsic, primoriial, ancestral, inherited, instinctive--whatever you wish to call it--fear of man as man. Man is only another large animal, rather dull and stupid and making clumsy movements. There is little need to fear him. Certainly much less than there is to fear from birds not of ones own kind, with their swift,precise and intelligent,hostile movements!

2:45 P.M. Rhody and Lizard and Rhody and Snake.

One reason why R is hard to find.

At 1:45 I attempted to look up Rhody. Again he "found me". In looking for this animal, one must look at his own back trail, because R has a habit of not moving (hence being invisible) as one passes by, then coming out behind one in a bored sort of way.

A test of R's "sporting instinct".

He wanted no mouse, but Julio happening to have just caught a lizard, I wished to test the view that Rhody, hungry or not, will respond to the presence of that reptile, from sporting instinct alone, if from no other motive. This would be in line with past experience. The lizard was placed on the ground by the lath-house on top of which R was resting now in the shade. He saw it at once, but was very deliberate in coming down to it, but he came. He wanted it to run and furnish sport, waiting patiently, then walking around it. When it bolted he was after it, but it got into a helianthum out of sight. R watched the plant closelyfor several minutes. Getting impatient, he reached in and lifted the lizard out accurately. He knew exactly where it was all the time. Then followed a series of releases and recaptures, interspersed with struttings,and wing-flirtings by Rhody over the lzrd as if in benediction. These lizards, as has been noted before, will play 'possum even when in a captor's bill and await an opportunity to dart away. Rhody got too confident and the creature got away from him into a pile of peat bales, etc. Then followed a careful detailed search by Rhody,without success, in which we helped. After several minutes of this Rhody went back to the

(Memory.)

helianthemum, the first point of refuge of the lizard (memory) now 20 feet away. He searched this, no longer patient, pulling up its branches with his bill and looking underneath. No results.

A sop to my ego.

Meanwhile I had seen the lizard's tail in a crack in the gravel-bin. (It always satisfies my ego, temporarily at least, to demonstrate the superiority of man, with his inferior senses and superior mind, over the wild creature with attributes directly the reverse.

Movie.

At this point it occurred to me that I was missing something photographically, so belatedly got the movie camera. Took 50ft. of R and lizard, but R's enthusiasm had waned, though he showed some of his earlier spirit. The lizard, as if realizing the limitations of a man with a heavy camera, kept taking refuge behind me.

Rhody bored by the snake, though interested at first.

It was then decided to introduce him to the gopher-snake, a creature 3½ feet long; one which past experience led me to believe he would not actually attack on account of its size, but would be interested in. So the event proved. R preferred to be an interested spectator, as the film will show. Since no experiment is ever a failure, however disappointing, the film will be of value nevertheless.

Adding lizard fails to increase his interest.

Next the lizard was placed with the snake, thinking that if the additional attraction would not bring R out of the ranks of the spectators, the snake might at least eat the lizard. No results. Rhody, who had been one of us during this snake episode and perhaps was under the impression that the whole affair was designed to give him an opportunity to do a little research on human behavior, lost interest, ran more rapidly than circumstances required off into the shade and began readjusting the set of his plumage. Here the matter ended. The lizard was released and the snake put into his cage for future exploitation. (I suppose *he* will get tame too). [illegible]

A young rat, now, that is another story.

5:50 P.M. When Rhody was again looked up at 5 P.M. he was ready for a young rat, hrooing softly as he waited in the shop for me to get it out of the cage. One squeeze and a short wait during which the wretched creature's urine dripped away, and it was gulped without ceremony. Instead of leaving at once Rhody came back into the shop as if for another meal, but only looked curiously at the one offered as a test, then slowly drifted away to dust himself in the road.

Wear and tear on Brownie's bill.

7:18 P.M. Just now, at the oval lawn, Brownie came with his satellite for worms, reminding me that his lower mandible is longer and sharper than the upper. This was first noticed three days ago (disregarding the instance of several weeks ago) because of the sharp prick which he administered when picking a worm from the palm of my hand--a new thing for B, but under the circumstances unavoidable. I will look up past notes and see which was the short one on last occasion..... ......See May 21st. note, when they were of the same length, or with the upper possibly a shade longer, whereas about a week and a half before that the upper was 3 mm. shorter.

Earlier in the day B administered one mild repulse to his charge--the first noted. Just now he was all solicitude, so that the youngster was not allowed to pick up worms tossed to him.

June 19th.

Rhody very docile all day.

"Retakes" of movies.

Defects of "Kodachrome" in its present stage of development.

As far as known Rhody did not leave the place all day, except when bed-time came somewhat before sunset. He was so docile and accommodating that I took the opportunities offered by him in an effort to secure "retakes" of colored movies made previously, and which had suffered badly in the processing. (A preponderance of red, no greens recognizable as such, long parallel scratches on the film, and many other blemishes. In recognition of their liability in the premises, the Eastman Co. furnished a fresh film without charge--not the first instance. My experience to date shows that, at the present time, every one of these defects is to be expected in Kodachrome film. The film should not be used--certainly at the present time--in recording action that ~~cannot be reproduced~~ is of rare or exceptional occurrence).

R announces his presence in cage.

When I looked for Rhody about 8:30 A.M. it was without success until one loud rattleboo from the cage, which I had just

R undoubtedly
oes purposely
ake his presence
known at
times.

passed, announced that he was there. This proved to be his last use of this call for the day. From the frequency with which this sort of behavior has been observed, it is impossible to resist the conclusion that the bird, on such occasions, is deliberately trying to attract my attention. He followed up by coming to the wire netting, still inside, at the point nearest to me, reaching through the mesh to take worms offered.

Not interested in
rats and mice,
but is in lizard
but
only for "sport"

Manages two
lizards simul-
taneously.

Displays with
them,
Loses interest in
one that dies.

At no time during the day could he be interested in mice or young rats. About 3:45 P.M., when he was up in nest 5-36, a live lizard was thrown up into the tree. It caught and held to a small branch a few feet from the nest. Rhody, with great deliberation, got it, came down and displayed with it before the mirror and elsewhere, let it go, chased it, over and over again. A second lizard was then put before him. He was able to handle them both, due to the lizard habit of playing possum, chasing first one and then the other, not trying to kill either, not trying to prevent their running into the bushes (apparently), interested only when they ran or made movements preparatory to running. Each would occasionally be brought back to the mirror with hroos and bowings. When one of them finally succumbed to the rough treatment and could no longer run, Rhody lost interest in him (he will reappear later in this note) and turned his attention entirely to the other. I am not certain, due to the fact that R became progressively more careless and much of the later action was in the bushes, but I think that one finally escaped.

At this stage my thought was that Rhody wanted no food of any kind, and, in every-day language, was simply playing. Previous to the lizard episode I had thought that his disinclination for mice meant that he was temporarily, as on previous occasions, "off of" mice.

I stimulate
his interest in
dead one tempor-
arily,
but
this suggests
to him a search
for a hypothet-
ical live one.

About an hour later when Rhody was resting on a pile of boards by the dormitory tree, I showed him the remaining, now dead, lizard. He was immediately interested, picked it up, squeezed it, dropped it and walked about it waiting for it to run. This was repeated twice again. There was no running. Rhody then began a search for a hypothetical *live* lizard in the pile of boards, since the dead one offered no possibility of sport, presumably. No results, so he climbed high up into a pine tree by the north wall of the house, for which he has conceived a liking during the past few days. The lizard was kept for further test tomorrow.

R in nest 4-36!

June 20th.

Experiment with
dead lizard re-
newed; same re-
sult.

Rediscovers
the dead one.

Disgusted?

Returns to nest
building.

I looked for Rhody about 7:50 A.M. Julio pointed him out, just coming out of the glass house (nest 4-36)! in the dormitory tree, which I had just passed. (There is the same picture again, with the house added). He perched on the wind-screen. I got the defunct lizard and laid it on top of the pile of boards. R was all attention, came down, went through the yesterday's effort to extract some fun out of it, found it wouldn't work, quit and went to the observatory roof via the pine tree (first time noted). An hour later I stood near the boards. R sailed down from the roof ran swiftly *sidewise* the full length of the pile (20 feet) with his eyes upon the cracks, found the lizard, considered it, but turned toward me and rattlebooed as if in disgust. Certainly a man-like action. My thought was: He rembers the lizard-board association, he has not forgotten that there is no fun in that particular dead lizard, he wants food, but is, as always, disinclined toward dead things, so we'll see if a mouse will satisfy the equation. Before I could put the idea into execution, however, he gathered nesting material and carried it up high in the pine tree mentioned, where I could not see him, but could hear

him whining.

Now ready for mouse and renews ritual.

When I found him, an hour or so later, now down from the tree, he followed me to the shop, whined and muttered as I fished for his mouse, grabbed it at once, began his ritual, included the mirror--everything with full honors--winding up in nest 5-36.

He tells me where he is.

I looked for him in the nest about 11 A.M., but he was not t there. However, when I approached the pine, four resonant rattle-boos, sounded from high up in it, though I could not see him. He had not been heard to utter a sound since last noted above.

(The snake takes mouse from hand).

(Referring to note on page 1205, suggesting that the snake might become tame: At noon I held a live mouse by the tail in front of him. In a flash he had it by the head and a complete coil thrown around it. Yes, this time a coil, not a bight as before, and the mouse was taken from hand).

June 21st.

Brownie ceases feeding young.

Brownie, beginning yesterday, is now getting worms from me entirely for his own account, showing probably that he considers his obligations toward his brood at an end.

Renews sub-song.

He is coincidentally giving more attention to sub-song.

Long full song.

Also from about 6:30 P.M. until after sunset (7;35) he sang full song almost continuously over at Robinson's, a new development of the season.

Rhody varies behavior resumes nest building.

Rhody introduced some variation in his recent behavior. Thus, as I was lunching in the cloister, a soft wooh, woo-o-o-o announced his presence 2 or 3 yards away on the lawn. He was not looking for me, in fact disregarded me entirely and began searching through the shrubbery for something. The something proved to be a forked twig. This he carried up over the roof toward the pine in which he has been so much interested lately; consequently I hurried there by a necessarily devious route, only to find no trace of him. Thinking he might have taken it to nest 5-36, I went there and found him working. He had carried this twig more than 70 yards.

The woo and hroo calls.

The wooh, woo-o-o-o salutation above referred to, is not the hrooh, hroo-o-o or hroo so often mentioned in these notes. While, of course, it is impossible to represent any of these correctly in letters of the alphabet, the forgoing indicates the distinction at least partially.

The woo is softer and higher pitched, and "smoother" than the hroo. It is more of a head tone. The hroo is deep and vibratory. It is used mostly when he has a mouse or a lizard and is going through his ritual. The stimulus which excites it seems to be different.

Ritual with mouse again, but new features.

He sings coo song

Later in the day, when it appeared that he would like a mouse, he followed me to the shop, got his mouse and began his ritual, but this time, introduced two new features. The first was to stand perfectly still looking steadily off to the north for several minutes. The second was add his courting coo-song, three times repeated in its entirety, before passing on to the mirror and then to the nest.

Tries to cast up pellet?

About 6 P.M. he spent about 5 minutes in what appeared to be strong efforts to cast up a pellet, without success. This is only the second time Rhody has been seen to make this attempt, though, as has been noted, Archie and Terry between them are

know to have cast up 10 (?) pellets in about 10 (?) months. Since mouse-hair, when the birds are getting a regular supply of mice, is regularly present in their droppings, it would seem that the casting of hair-pellets represents more of a measure to correct faulty working of the digestive apparatus rather than a primary process in itself as with hawks and owls. It might be said that the road-runner is sick when he does this.(?).

About 7 P.M. I looked for Rhody at his roosting place in the oak on the west lot. After several minutes he was seen sitting in perfectly plain sight in the adjoining tree, the branches of which interlace with those of the roosting tree. It took him about 15 minutes, during which he made four moves, to cover the distance of about 15 feet to his roost, where he arrived at 7:18½ exactly. Sunset 7:35. This is a narrower margin than usual.

Although Rhody appears still to 'ave 'opes, he is doing less of his symbolical incubation in nest 5-36 than formerly, and is less attentive to the magpies.

June 22nd.

Rhody, surveying the world from the observatory roof at about 8 A.M., chose to disregard all activities nearby on a lower plane.

At noon he was taking his turn in 5-36.

At 1:10 P.M. he was still in the nest.

At 2:30 he was out of it.

Brownie was not seen to feed any of his brood all day and was rather independent.

June 23rd.

At 7:30 A.M. Rhody was in the nest and did not care to come down.

At 8:30 he was down and attracted my attention by whining, following me eagerly to the shop, whining and muttering while I got him a young rat. This he killed at once by squeezing and gulped without benefit of ritual of any kind.

After this, for two hours or more, he lay on the tiles of the observatory roof, comfortably digesting and placidly observing.

At 11:30 he suddenly appeared where I was sitting near the cage by a chrysanthemum bush about 4 feet high and rather sprawling in habit. He saw, or pretended to see, something menacing in it and proceeded to dash into and through it, with wide loops 50 feet or more in major diameter, away from it, with loud rattle-boos and posturings, for the next five minutes, but always keeping either the bush or me the focus of his activities. It looked as if the rat was "getting into his blood" and had proved a little heady! The excitement subsided as quickly as it arose and he became, at once, a staid and gentle citizen for the rest of the day.

For about 2 hours in the afternoon, while visitors were present, he remained in nest 5-36.

About 5:30 P.M., mewing of spotted towhees outside the fence to the north attracted my attention, and I went there to see if Rhody might be the cause of it all. He was preening innocently in the branches of a pine about 6 feet from the ground. He was the center of attention of brown and spotted towhees, wren- and bush-tits, plain titmice, 2 Bewick wrens, one Anna humming-bird, but paid no attention to them.

Thrashers were coming and going at the oval lawn while I sat there with my visitors, amongst them Brownie, who came across for worms, but took none away. He was not followed, to me, by any of his brood, although at least one of them was present at the lawn. This one Brownie took considerable pains to run over accurately and then instruct afew seconds in shadow-boxing.

June 24th.

At 8 A.M. Rhody was lying in nest 5-36. He whined as I approached. When I talked to him he stepped out as if to come down, but reentered to adjust something about the structure. (There it is again). This finished, he came down, followed me to the shop-yard, but there chnged his course, climbed his recently favored pine, went out on a long branch perhaps 30 feet up, where I lost track of him.

At about 9:20 he reconsidered the rat subject and honored the sacrifice with full ritual, including presentation at the mirror and consumption at the nest.

In a less than an hour he was down on the ground sunning, using the spred-eagle pose, since the air temperature is too high for the open-bowl type. This was follwed by the usual retreat to the shade to cool off, and so forth.

R's moult.

It was noted that he has several brand new tail feathers sprouting. It was observed several days ago, but not recorded at the time through oversight, that, at that time, it was estimated that he was spending as much as 5 or 6 hours per day in preening, and that his attention was concentrated at the base of the feathers from which he was presumably removing the new sheathes.

At 10:50 Rhody began gathering pine-needles with an air of intense concentration and interest. These he carried up to nest 5-36. How powerful is this nest-building instinct! While the impulse to reproduce seems to be subsiding, as has been noted, stil it appears to revive in waves. It may perhaps be said in "damped" waves, i.e. waves of decreasing amplitude as in an oscillating electrical circuit, but probably of decreasing frequency.

This year he was first seen to work on a nest March 10th., although it was already big enough for him to lie in comfortably at that time. The fifth nest of the year: Nest 5-36, was observed under construction April 30th., nearly two months ago!

At 11:30 he was lying quietly in the nest, but when I spoke to him, stood up and began to poke about with his bill along the periphery. I suppose, from his long contact with me, that I and my voice, form part of that association in the poor bird's mind, which consists of an inextricable tangle of mice, rats, men, cameras and mates, all hooked on to nests as an inseparable concomitance of the breeding cycle, and that when I appear at a time favorable to action, he "just has to" prod about the nest! I like to think of the act, however, as one inspired by a guilty conscience stirred by the owner's being caught loafing.

1:30 R still (or again) in the nest.

News of Archie and Terry?

Donald Brock called about 1 P.M. and I arranged to go with him to a point 3 or 4 miles from here, near Mills College, where, according to local residents, they have been seeing road-runners since Easter. One of them is said to frequent the garden of a house at 6015 Majestic street and its neighbors and to be seen frequently sitting on a hammock there.

Brock says one boy says that he sees two in the neighborhood and that one "has red on it and the other has not". (Archie's red was much more conspicuous and deeper in hue than T's.

5:30 P.M. I have just returned from there. Shortly after arrival, about 2:45, a roadrunner was seen in thelot west of the house mentioned.* While Brock waited and watched, I approached it slowly. It did not retreat. When I was about 30 feet from it I tossed a worm part way to it. It came at once and got it. I knelt on one knee and showed the worm box, suggesting that it come and get more worms. It came at once and took worms from hand freely. I suggested that it come up on to my knee, which it did. Next I produced some hamburger steak which it ate hungrily. When it lost interest and showed a tendency to wander off I produced a very small mouse. This, as with all other offerings, it took from hand tamely. From the first sight of it, even before I had tossed the first worm, I was certain that it was Archie and had been calling him by that name. Archie it was because of known scars on beak and back of head. But an Archie that has encountered trouble since, with fresh scars added to the old. His eyes have lost the gentle, soft appearance of earlier days and look wild, though he is tame. He is still smaller than Rhody, I judge.

He went up into a low pepper tree and I called Brock--who had watched all that went before--to join me. Archie, though nervous, did not retreat. As a test to give an indication of whether Archie would distinguish between Brock and me, i.e. remember me in a special sense, I asked Brock to offer him the remaining mouse. (He is more accustomed to wild birds than I am). Archie edged away on his limb. I then took the mouse and offered it to him, and he accepted it at once, even advancing for it.

Just before this, it should have been noted, I had made a test to see if Archie would follow me when I retreated and called, finding that he would.

He next went up into the garden of one of the houses and was relocated above a rock-garden on a sloping bank. A test was made to determine if he would come down to me across the garden, on solicitation. He did, and I secured a movie of him as a record.

He finally went up about 8 feet intoa eucalyptus tree and disposed himself in road-runner fashion, with tail flattened against the trunk, as if for the night, where we left him about 4:30. If not his night roost, it at least meets the road-runner specification of a wide outlook to the west, good landing field and protection from the rear.

He had eaten 4 good sized pieces of hamburger, two small mice and a dozen or so meal worms. He should have had enough for the rest of the day, and although rather early, it seems probable that he had called it a day.

10:15 P.M. Well it was Archie's roost for this night at any rate, for I went over to see him about 8:30 and he had not moved a fraction of an inch, as far as I could see. I introduced myself at the house in the garden of which he was and was most courtesly received by Miss Georgiana Melvin, a teacher at Mills. I took her out and showed Archie to her, much to her delight. Miss Melvin introduced me to her neighbor on the south: Dean H.B. Ege (6015 Majestic Ave.) formerly of Mills, and her neighbor to the north, Mrs. Wild (H.G.), whose husband is or was also of the Mills faculty. All are pleased to have Archie as a neighbor and will try to protect him, but there are boys in the neighborhood that have tried to shoot him. I was given some of the names and will look them up and try to enlist them on A's side.

* I called "Archie"! It stopped at once and looked about

June 25th.

Rhody was in nest 5-36 at 8 A.M. I had little time to devote to the birds today, but noted Rhody about the place a few times on happening to be out on the garden.

Also thrashers at the oval lawn.

June 26th.

At 7:15 A.M. Rhody was sunning his back near the cage and whined on seeing me. I gave him one of the young rats, now about reaching the limit if his capacity to swallow. R needed this rat for himself, so no ritual.

Uncoordinated nesting by Rhody.

About 8:15 he went up and examined the interior of the glass house and fussed with nest 4-36 inside. He then observed a rough platform of a half-dozen twigs that I had placed, a couple of months ago, in Brownie's old nest site in the dormitory tree, hoping that Rhody would adopt it for one of his nests. This platform is about 5 feet horizontally from nest 4-36. For several minutes Rhody worked on it energetically, spreading out the branches, bending growing twigs aside and apparently making a careful estimate of its defects and advantages, as judged by his close scrutiny of everything in and around it. He then came down, got a twig and placed it carefully in nest 4-36 instead. Down again, he got another twig, seemed to consider what to do with it, took it to the mirror (for inspiration!) then took it up to 5-36 ! Rat-juice is evidently strong medicine, but it does not seem to be an aid in coordination of nesting activities.

ARCHIE

About 10 A.M. I went to look up Archie, work up sentiment among the people (especially boys) of the neighborhood in his favor, find out who his enemies were, and decide whther or not to he should be allowed to remain there, in view of the dangers to which he might be found subjected.

First the Risdon boys were talked to and left in a state bordering upon enthusiasm in his behalf. It developed that it was an older brother that had caught him and put him in a chicken coop and then released him. Possibly that is where some of his damage occurred.

Next three boys at the Hill home. All of these had seen him--the mother of some of them (I don't know who they were) had tried to photograph him, but could not approach him. "Nobody" could. "Everybody" liked him, but there were some tough boys at the bottom of the hill that had tried to shoot him. He had been seen that morning. I told them his history, etc. as I had the other boys. Suddenly Archie appeared about 100 feet away crossing the street. I called to him and he stopped. I told the boys to watch and see if what I had told them was not true. I called Archie. He came trotting up to me. I invited him to my knee and he jumped up and received a mouse. Here the boys seized their dog and kept him from trying to catch A. One boy rushed into the house and brought out his mother with a camera. She plumped down upon the ground with camera ready. An automobile buzzed by. A bolted, but came back on call. Another car approached. The occupant saw what was afoot stopped, got out and walked to her home avoiding A in a large cirfle. (She proved to be a Mrs. Gibbons, knew Archie and knew where slept--for several weeks). I called Archie to me where Mrs. Hill could get a "shot" at him and he

3W

jumped to my knee for another mouse. The dog broke away and chased Archie out of sight. I introduced myself to Mrs. Hill and told her what I was trying to do. She volunteered to speak to the boys that had tried to kill him. Everybody on top of the hill likes him, but did not realize he was a tame bird.

I located , during the various conversation, the approximate focal point of the "enemy" and went there, rang the door bell. A man came out one door, a woman the other. I don't know their names. I explained my mission. They were pleasant enough but the woman said: "I hate him". The basis of the hatred proved to be that Archie had been seen by her eating a sparrow, that she had taken one away from him, that he chased all the birds; "everybody" hated him; she had spent a long time attracting bird to her place and he had chased them away and killed them. They were all trying to kill Archie and had been shooting at him, but had not been able to hit him, but would get him yet! This looked like an impasse. Basically she was a bird-lover actually. I explained the results of road-runner stomach examinations as showing the balance was in favor of the road-runner. Explained effect of man's disturbing Nature's balance, upon man himself, etc. She wanted to know if I couldn't take him away. Said if he stayed she would stop feeding the other birds as she would not attract them only to have them killed. She was weakening, so I conceded appreciation of her feeling for birds(which was undoubtedly genuine) and we got into friendly conversation. She and the man are English. The shooters were her next door neighbors. She is undoubtedly t_he_ focal point of infection and her stand is not unreasonable, though, as I explained to her as diplomatically as I could, one which, if followed up by direct action against the bird would bring the actor into conflict with the law, and I would see that appropriate action would be taken.

She wanted to know how I would find out! I think I convinced her that it would be easy, but will omit details here. As a matter of fact, while I probably would have difficulty in proving anything before a jury I am reasonably certain that, through certain boys, I would have no difficulty in actually locating the culprit.

I think I gained at least a sort of armistice for Archie, but no more. If he should stay in the neighborhood he would evntually be shot. I had already resolved during the conversation to take him away, but did not tell the woman so. We parted on a reasonably friendly basis, though "in suspense".

I arranged with Donald Brock to go with me after dark and get Archie. So about 8:30 P.M. called on Miss Melvin and two of her friends to explain our intentions and "square" ourselves with her. They were all rather sad about it, but could see no other way out.

We found Archie in his roost. One little squawk, two little squirms, and he was in a well ventilated paste-board box, perfectly quiet. When I opened it here he was lying down, tail up against the wall in approved road-runner fashion. He is now, 10:10 P.M., tail up against the wall, on his old shelf.

The plan, at present, is to let him recover from his head injury, in the cage, if he can brook confinement now, then take him out to Lake Chabot where there are road-runners, and where the public is excluded and the territory patrolled.

It was noticed today, that, due to the head injury, the white part of his skin-patch has turned green.

I learned, while at Miss Melvin's this evening, much to my gratification, that the boys I had talkedto in the forenoon ,

were actively "educating" the other children of the neighborhood about Archie. No doubt Archie's opportune support of me before their very eyes proved convincing. I feel a little guilty, after having praised him to the skies and telling them how to approach him and gain his friendship and protect him, about sneaking in and spiriting him away.

The next step is to see how he reacts to confinement.

June 27th.

At about 7:15 A.M. Archie was found friendly and undisturbed in his old surroundings, apparently not at all concerned about being surrounded by wire netting. He accepted a young rat readily.

The next step is to see how he reacts when Rhody finds him in the cage. If too badly frightened he will have to be released, but, this time, will be taken out to Lake Chabot.

8:50 A.M. At 8:30 Rhody was at the cage staring into it intently. Archie was out of sight booing, hence frightened.

Rhody next went to the mirror and began looking into it and behind it. It is months since he has done this. He studied his reflection calmly as if to determine whether it was Archie. There was no display. His actions were those that one associates with reasoning beings. He gave up, plainly puzzled; considered adding something to nest 5-36, but followed me to the shop-yard; changed his mind and went to the observatory roof.

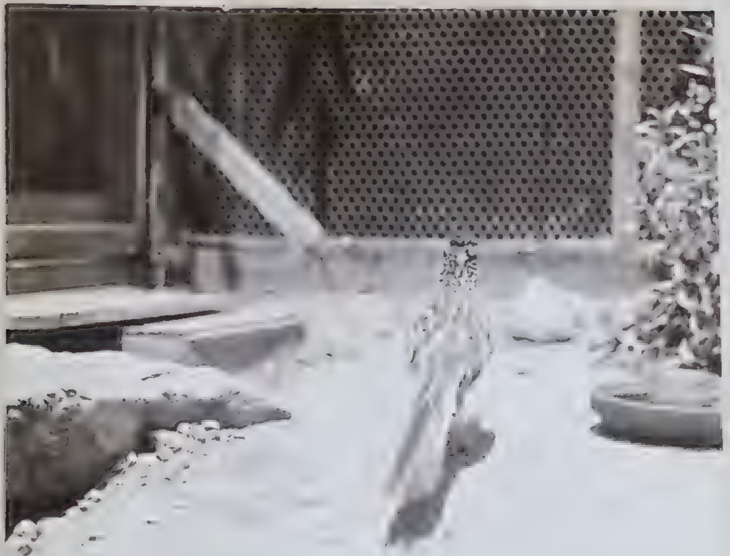
I went into the cage to look up Archie. I actually could not see him until I first heard the sound of his feet on a perch in the acacia foliage. He came down, booed once, but did not seem to be afraid of me, then went to the outer cage to sun and preen. There was no sign of his having made any effort to escape from the cage at any time, but further encounters with Rhody will be closely watched.

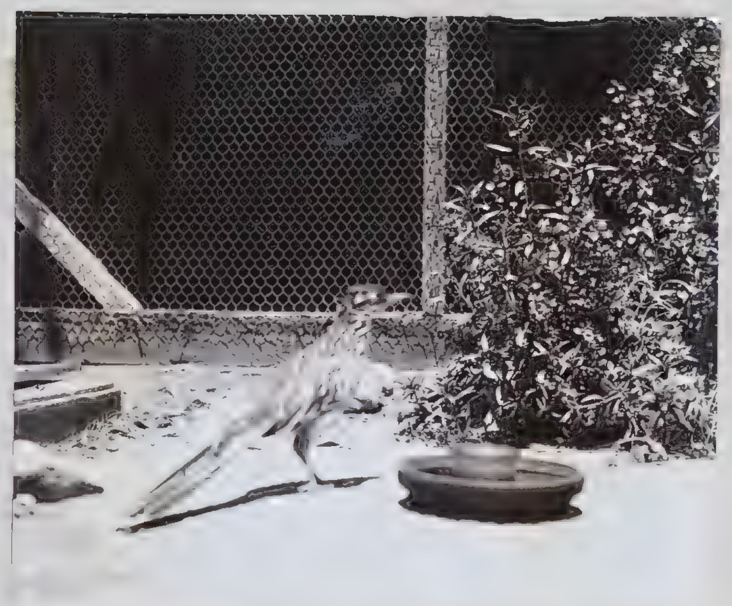
Examination shows that, due to the injury at the back of his head, both skin patches are suffused with green throughout. The normally white portions are entirely green. The "red" is greenish orange. All wounds are healing. He may have been creased by a bullet.

It is strange that, after all the vicissitudes through which he has passed, during 2½ months, he should not fear me.

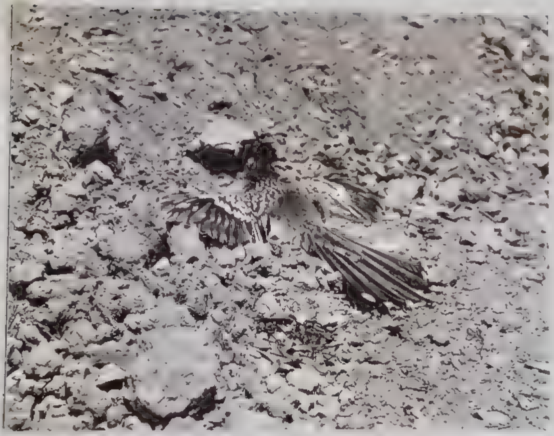
Likewise it is noteworthy that he has retained (presumably) the fear of Rhody which he acquired only during the last two or three days of his captivity.

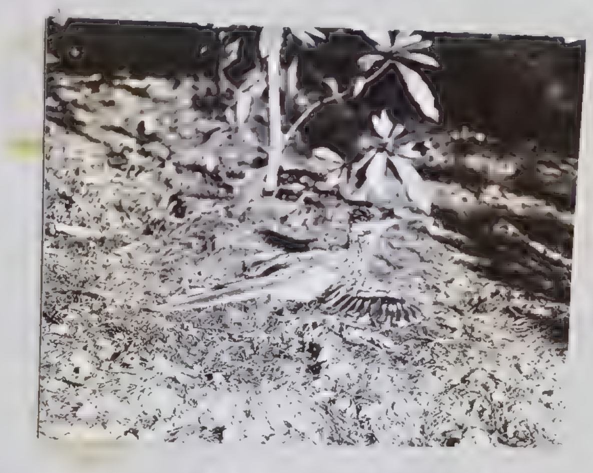
hody and Archie. 10:25. At 9:40 Archie was resting quietly on the ground in the S.W. corner of the outer cage as Rhody approached from the west. He had been picking up pine-needles and leaves and walking back and forth parallel to the wire just before that, as if wanting to take them to a nest outside. (I.e. Archie had). Rhody was really headed for the magpies, I think, and could not understand why there was now a door to interfere with his entrance. On seeing ech other, both birds cocked up head and tail; Archie retreated, stiff-leggedly, to the inner cage and booed once. Rhody watched quietly. Finally he mounted to the roof over A's head and A went to the point farthest away, in fear. R selected a point on the roof where he could see most of the inside of the cage. A paced up and down restlessly looking for a place to get out, but not in panic. R shifted to a still better place on the roof. A froze at once, as he does for a hawk. The first time one road-runner has been observed to freeze for another. R main-



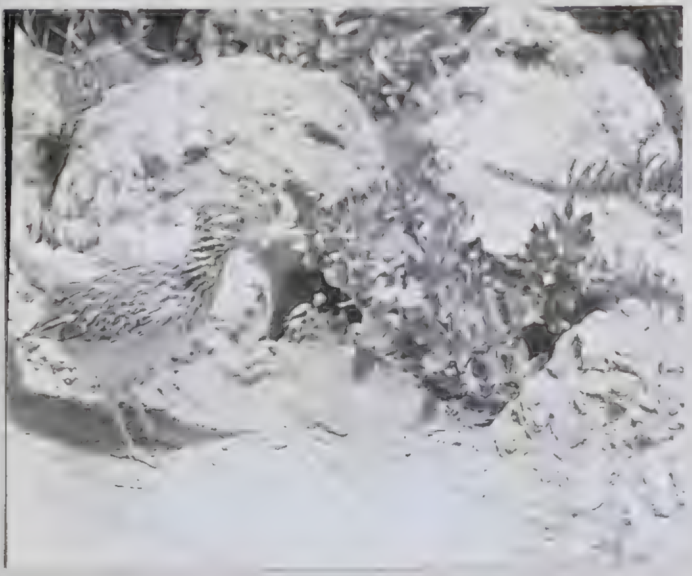


Archie back in cage after being away and unseen by me for two and one half months. Note injury on back of head. (Lens too slow for sharp image). June 27th.,1936





Rhody does a couple of spread-eagle sun-fits, July 18th., 1936.



Rhody looks for Archie in cage after Archie was taken away.

tained a statuesque pose. A verged upon panic, made one "pass"a at the wire netting, but apparently remembering, drew back in time to avoid injury. R came down. A retreated to sanctuary in upper annex in the acacia foliage. R looked for A in the mirror, darted off in a series of fantastic loops through the bushes away from the cage, then retired behind it.

At 10:10 he came back, but at no time was he really aggressive either then or previously. I got a mouse for him, but he walked by me headed for the observatory. (The roof of this rolls off on to an elevated pergola. Boston Ivy, Ampelopsis Veitchii grows on both). R suddenly pulled off a three foot dead section and headed along the roof for his favorite pine, changed his mind and made for the mirror, presented his trophy there, then carried it up to 5-36, having forgotten all about Archie, apparently, who remained in seclusion.

Archie had approached panic at one stage, but had not quite reached it. If he is too much disturbed by R he will be taken away as stated. He will not "stand up" to Rhody at all.

Archie greets me.

A in nest.

A makes new sound.

At 10:50 I went to the cage again, R not in sight. Archie greeted me by lowering his head and whining. (Like old times). He went up into the remains of the nest that he and Terry had built, lowered his head and kept on whining. I went inside and offered him a twig. He did not want it, but cocked up head and tail and uttered a sound, new in my experience with road-runners: an extremely low pitched rattling sound deep in his throat.

Rhody comes

He stiffened up at once upon sight of Rhody coming, but did not conceal himself, pacing back and forth in full view, using my knee as a stepping stone in his course.

Archie has lost the gentle look which he and Terry had and which Rhody still keeps. He looks wild and wary and is understandably nervous and jumpy. The yellow ring about his pupil is much more prominent than it was and seems wider even than Rhody's. This gives his eyes a staring effect. As his head is ragged he looks unkempt. He is moulting, but his tail feathers are bright and colorful. He looks no larger and the difference between him and Rhody remains.

At 11:30 Rhody was again at the cage, displaying more actively. Archie remained in plain sight. R gave up trying to make an impression, clowned in the bushes, then consoled himself by taking a twig up to 5-36/

1:40 P.M. If Rhody is not ~~is not~~ in sight from the cage--A being therefore, more at ease , I find that he whines on seeing me when I reappear. This has happened on each of the three visits since last paragraph.

About noon, when I was sitting inside the cage on the old bench with which he is familiar, he brought three separate loads of leaves, twigs, etc. and dropped them at my feet. He also brought a stone.

The next time I was there he brought a leaf and dropped it on my shoulder and then appeared to study my face.

Just now he started moving a few scattered twigs that were in the sand-box, from one end to the other, whining. I offered him more twigs. These he took and rubbed carefully into the sand in a rough semicircle about himself. He tired of this and went to the old nest, above referred to, and began to whine. I handed him one twig after another--about a dozen--all of which he placed

with some care. When Rhody approached he wanted no more. Rhody is really behaving with commendable restraint at the cage. He finds outlet for his nervous energy by clowning sorties through the bushes.

2:06. When I went out at 1:50 I learned from Julio that Rhody had followed me into the shop. I found him on top of the cage and he quickly repeated his journey of a few minutes before. I hoped that he would show some recognition of Archie's presence in the ritual that followed, but if he did, it was of a negative sort, for he did not even take it to the mirror, being satisfied with the sash over the seed boxes. He passed directly by the cage and up to 5-36, without omissions other than those noted.

When I approached the cage Archie dropped down from a perch above to the sand-box, crying and coming close to the wire, facing me, then rearranged one twig, still whining.

It is extremely interesting to observe his old pattern unfolding.

As yet he has not reacted to sight of the worm box, but for that matter, neither has he accepted worms. Probably the rat breakfast has had something to do with it.

Until about 7 P.M. Rhody was never away from the cage or its immediate vicinity for more than a half hour or so at a time. His attentions, though persistent, continued in "good taste". They worried Archie just the same, but he did not again approach panic stage, nor did he conceal himself in the acacia again.

Rhody, several times again, relieved his pent up feelings by sudden booing dashes through the bushes, and once again, presented a twig for approval at the mirror before carrying it up to 5-36.

Archie repeated his new call and gesture a few times more, once, about 7:30 P.M. from his perch on my shoulder. He also "brought me more presents". One of them, a twig bearing a tuft of pine needles, he deposited on my shoulder, saying: Ook, ook, ook.

At bed-time he became restless, repeating former behavior, even after Rhody had gone. I finally remembered a device I had used under similar circumstances during his former confinement: holding out an arm below the shelf where he "ought" to roost. This worked at once and he hopped to his old place, tail against the wall.

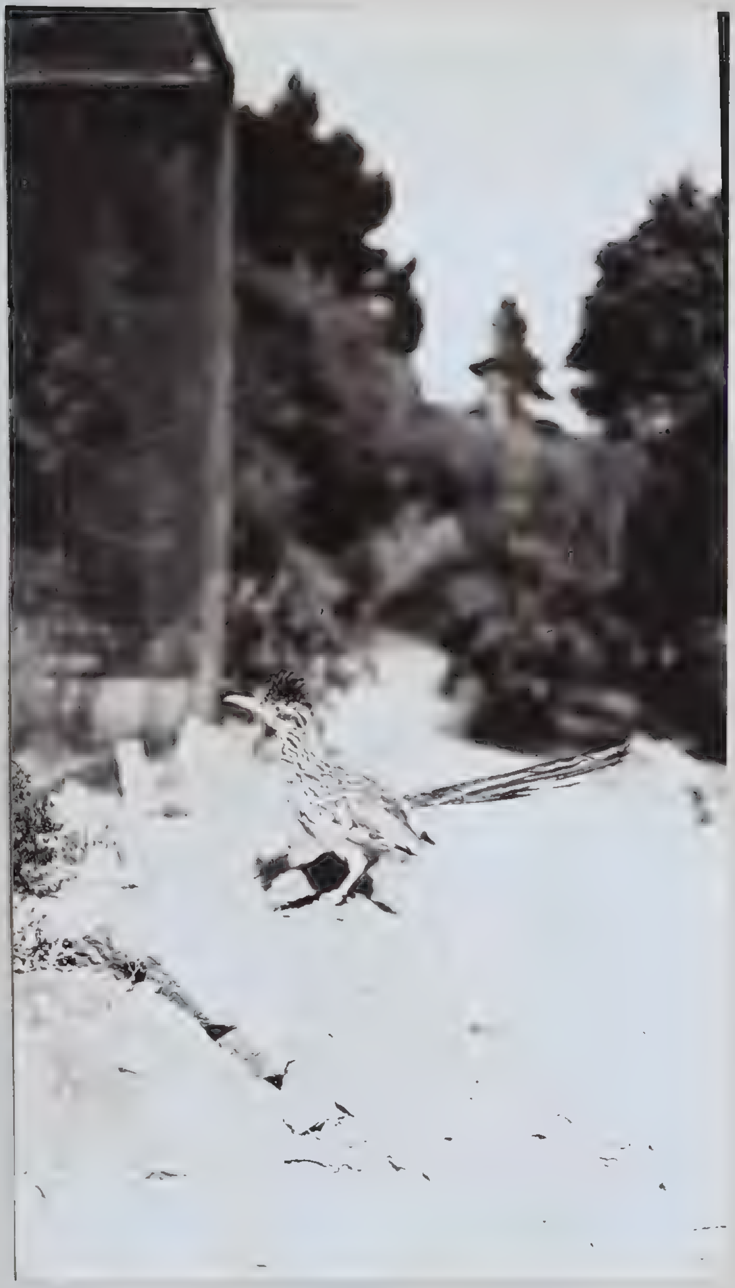
He had refused all food offered during the day, except the rat. He did not appear to chafe at confinement, nor did he ever touch the wire netting, as far as I know.

June 28th.

At 7:30 A.M. Archie saw me approaching, lowered his head and whined, although I was too far away to catch the sound. He then jumped down from his perch, clapped his wings over his back (There is the pattern again), ran to the sand-box and began to arrange twigs, whining.

(Archie's ma, whine, cry, or whatever it is, differs from R's. It is a monotone without crescendo or diminuendo. R's rises in pitch, then falls; volume ditto).

Rhody was not around so Archie was gentle and friendly. I gave him a nice, live mouse. He then brought a leaf and dropped it in my lap and sat there quietly. When I touched his feet, he lifts



Rhody watching Archie in the cage.

(June 28th., 1936)

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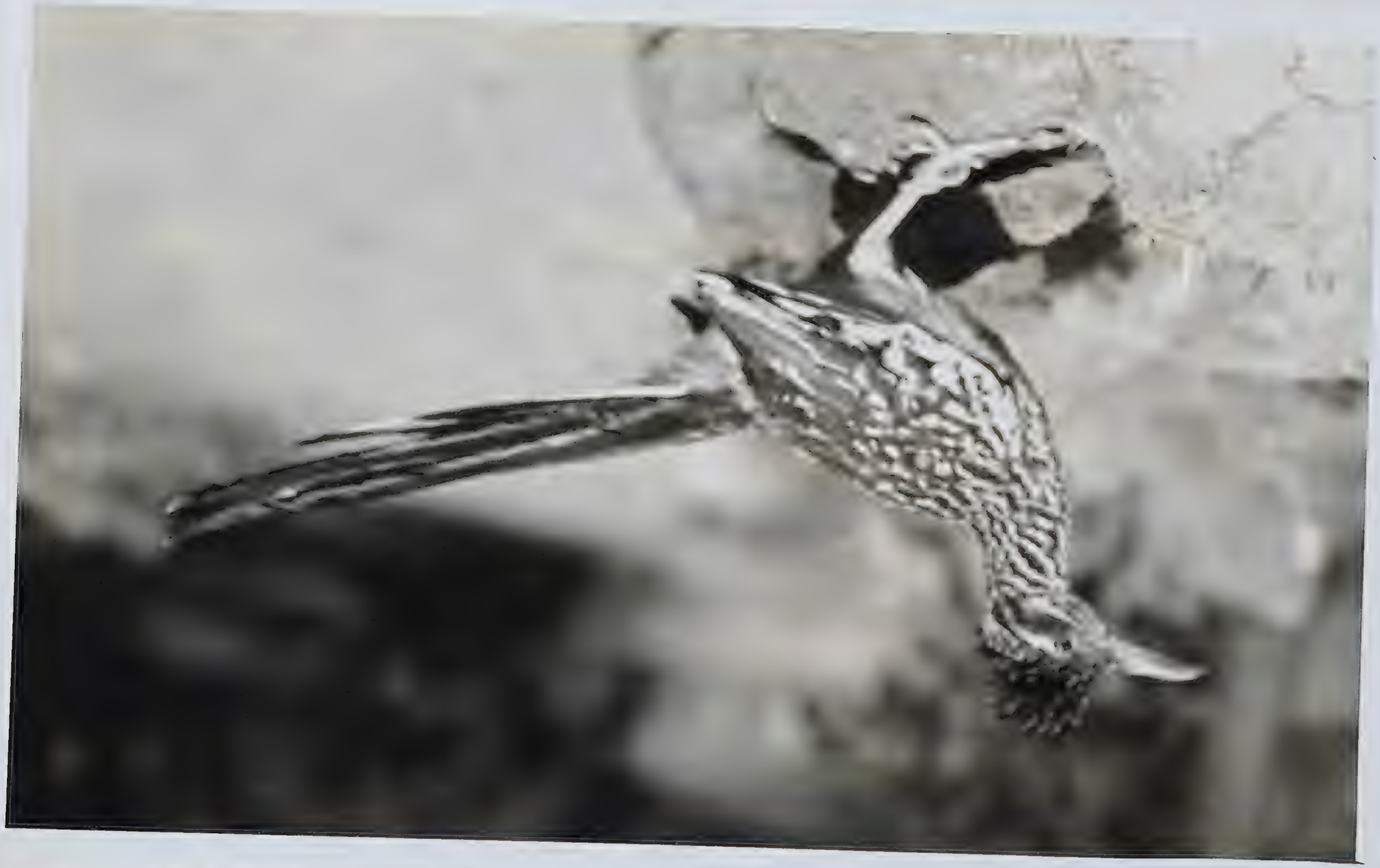


one and placed it on my hand, as formerly. The pads underneath are still soft. He mounted to my shoulder and gave his peculiar, new call which is topped off by a jerk upward of head and tail. He came down to my lap and ate worms contentedly from the box. When he saw Julio coming, he jumped down and got another leaf.

9:15. At about 8:30 Rhody trotted out to meet me from the bushes near the cage, looking very meek. I could not see Archie and everything was still. I went inside and found him frozen, with upper mandible newly scraped and raw. R came to the cage and looked in quietly. This was too much for A and although he did not go into a panic, the mere sight of Rhody is intolerable to him, and there is no peace for him as long as Rhody can be seen. It is, therefore, evident that he must be taken away unless matters improve.

At 9:25, R in his pine tree, but invisible, Archie calm and interested. He goes to the sand-box and calls for assistance. I help him with his nest. He makes his comical new call and gesture and shows no fear of me whatever, allowing me to put my hands in such a position that, by merely closing them he would be a captive. I may have to "do it", but I don't like the treachery of it.

I suppose I have Territoriality to thank for Rhody's continued presence and to objurgate for its effect upon Archie! The environment from which Archie was abstracted was evidently his territory, since he had been known in the vicinity for nearly 2½ months and I found that Mrs. Gibbons had known his exact roosting place for, as she said, "several weeks".

About 10:30 I went into the territory of Archie's enemies and saw Mrs. Walker, the one that hates him especially. Explained what had been done. She readily consented to notify me of any road-runners appeared again. I told her if they did I would try to get them.

Archie now seems to be concentrating upon the device of freezing when R is looking for him. It works fairly well and seems to puzzle R.

1:30 P.M. Twice Archie has taken refuge on my lap and sat there quietly "holding my hand" when R has appeared. A touch on the foot does it. Possibly he extracts some comfort from it.

Somewhat later when he had taken refuge on the ground near me, this performance was repeated and he became drowsy, his lower lids gradually creeping upward and his eyeballs turning downward. When about to pass into the land of Nod he would sway slightly and then recover, then repeating the cycle again.

Rhody stayed away from the cage from about 3 P.M. to 4:30 and Archie relaxed, stretched out on a shelf and had a series of good naps, only to become tense and watchful on R's return.

Three times during the afternoon, while I was in the cage, Rhody brought nesting material and dropped it at the mirror.

At bed-time Archie sought his old shelf without guidance. When I passed by the cage at 7:30 he caught sight of me through the window and greeted me with one whine.

Archie's new tail, though not quite complete as yet, is beautiful in its metallic reflections of rose, copper and varied greens. If there are "hunger marks" on it, they are not conspicuous.

June 29th.

At 7:30 A.M. Archie was stowed away in the upper story of the inner cage, so presumably he had had a visit from Rhody, though that animal was not visible.

He came to the outer cage where I offered a mouse, but he was intent only upon climbing to my shoulder, where he disposed himself comfortably for a long stay. Dangling the mouse under his bill brought no results.

Rhody suddenly appeared from nowhere with a bill full of pine needles, running rapidly by the cage headed for 5-36, concerned only with his mission. Archie froze at once (Julio said) but stayed. It was only when the mouse was placed on the ground that Archie became interested, captured and ate it. Although he meant business, it was clear that he lacks the strength of Rhody still.

A test was made to determine if he had lost his old reaction to the worm-box. On its being held up where he could see it, closed, he responded at once by jumping to my lap and reaching into it as soon as the lid was removed.

Archie and Terry were accustomed to pass from the inner cage to the outer portion by the only available route which involved passing through two doors and a right angled turn. Although there is now a direct passage between them formed by removing half of the wire partition between the cages, in effect throwing the two into one, Archie still uses the old route, even when in a hurry.

Except when Rhody is present or is seen , or has been present so recently that Archie is still disturbed, he is, as far as I can see, completely restored to the status quo ante. Even that reservation might be eliminated if we consider only the period of his last few day's confinement in April when fear first entered the picture.

10:30 A.M. Archie's fear of Rhody seems undiminished, but his technique is improving. He has evidently learnt something while at liberty, for, on the last several occasions of Rhody's visits, he has simply hidden and remained quiet. No long, frantic run to escape. For example, just now, on R's approach, he was sunning himself on top of a rock in my Upper Sonoran scenery, and merely dropped behind the rock and under a monkey flower. He fooled me, as I had thought he had gone into the inner cage through the opening which I have just said he does not use, and it was only after a thorough search inside the cage that I saw him accidentally He had moved from his post only about 2 feet. Rhody instituted a search outside the cage, gave up and fell to spread-eagle sunning, then preening, 20 feet from Archie's retreat. By accident, too, since he had abandoned his search, he caught sight of Archie and moved toward him. A saw that he had been discovered, went to the other side of the cage and began sunning himself. When R, who is under the disadvantage of being forced to use exterior lines of communication, renewed his approach, Archie, who has the advantage of interior lines, slipped into the inner cage and up

into the concealment of the acacia. R then mounted to the roof, but A "stayed put". I left to make this entry.

At the moment it looks as if A, unless caught unaware, will be able to resist panic. (That is, if pressure upon him is not too persistent).

As noted, Archie's facial expression is"harder" than when he left, wilder and more watchful. There are intervals when it softens. Users of steam boilers have an empirical classification of waters based upon "permanent" and"temporary" hardness. Archie's expression seems to lend itself to similar analysis. There is a hardness which peaceful surroundings may banish: "temporary hardness"; and a hardness which appears to be permanent due to the increased width of the brassy ring surrounding his pupils, perhaps.

On~~e~~ one of Rhody's visits to the cage this morning it was observed that he retrieved some of the nesting material which he had dropped at the mirror yesterday and carried it to 5-36. A model of optimism.

Rhody's interest in other birds has frequently been commented upon in these notes, and most of it ascribed to curiosity. Yesterday it was extended to ground-squirrels. While at the cage he saw two squirrels ten yards away and promptly ran to them, stopping a yard from them. When one ran away he watched it until it disappeared. The other he watched, with an occasional flirt of the wings, until it also left, though unhurriedly. R then returned to the cage.

Archie's attitude toward the magpies may be said to be no attitude at all, for he ignores them entirely, even when they approach within six inches of him (with the wire between) and make comments. (They are, I think, not attracted by him, but my presence there with him and the consequent possibility of food).

12:05 P.M. Archie has just had his second mouse of the day. Again the difference in strength (and skill?) between him and Rhody was marked. It was not a large mouse. Rhody, unless he wanted such a mouse for his ritualistic rites, would have given it a squeeze or two without any necessity for hammering it on the ground and the mouse would have been dead. Archie whirled this one over his head and beat it upon the ground fully twenty times, squeezed it, etc. and it was still squirming when he swallowed it. Perhaps he will get more pep under this system of diet.

Rhody, yesterday, was again observed in what appeared to be a prolonged effort to eject a pellet. The action was accompanied by vigorous throat-scratching. No visible results.

Rhody sometimes turns around to look at his stool. As the act of defecating is sometimes accompanied by a popping sound, maybe it is this that attracts his attention. On the other hand, it may be that he is checking up on the functioning of his digestive apparatus!

About 1 A.M. Archie was reposing on a board at the entrance to the cage, whining as I appeared. I entered. He soon returned to the same spot to continue his siesta. When I left at 3:30 he had dozed there continuously until 3:45. He then gave me an opportunity (after bringing me a "present") to try for color films of the metallic colors of his tail, returning to the board to

finish his snooze. There I left him at 3:30. Rhody remained away, thus giving him the opportunity. I do not recall his having been so sleepy before his departure.

Rhody returned about 3:45 and Archie sought refuge in the inner cage.

There was no panic during the rest of the afternoon, but Rhody was not very aggressive.

At bed-time Archie went to his old shelf, whining when I went out later to see if he was all right.

June 30th.

At 8 A.M. Rhody was pretty persistent and Archie frightened, but R soon desisted.

At 9 A.M. Rhody was again at it and Archie was fast approaching the panic stage and striking the wire. Rhody was all about the cage: sides, roof, everywhere, paying no attention to me. He repeatedly tried to get into the cage. When he lost sight of A temporarily, he would look for him in the mirror, peek under the awnings on the roof, climb up the wire netting and dash about. Archie was bleeding, so it was decided to catch him and take him away. When I went inside he came to my shoulder confidingly--I hated the treachery of it, especially when he settled gently upon the hand that I pushed under him--but there was nothing else to do and I grasped him firmly in both hands and put him in the box prepared to receive him. He is very strong and "sudden" and got away from me. Rhody continued his efforts to get in and join the party. Archie froze and I picked him off of his perch and put him safely into the box this time. He ceased struggling at once and remained quiet while I drove about 15 miles to the east side of Lake Chabot, then carried him a mile inside the fence to a place where there was water and everything that road-runners like. +

There the box was opened and he stepped out calmly, not at all frightened in appearance, but evidently much interested in the new sounds and sights. He showed no fear of me at all, and for several minutes did not move two feet from me. He accepted worms, but did not want the meat and mice I had brought. I stayed with him about a half hour. In this time he had traveled about 30 feet, not objecting to my following him. I gave him some more worms and left him. If he will stay there, in the reservation where there are other birds of his kind, where it is patrolled by at least one friendly guard (Hambrick), he will have a good home, and only his natural enemies to avoid. There is abundant food, cover of all kinds, lots of warm, bare hillsides, water and no human habitations. During my walk I saw a half dozen lizards, four snake tracks and tracks of deer. Bird song on every side and sounds of grasshoppers, crickets, etc. everywhere.

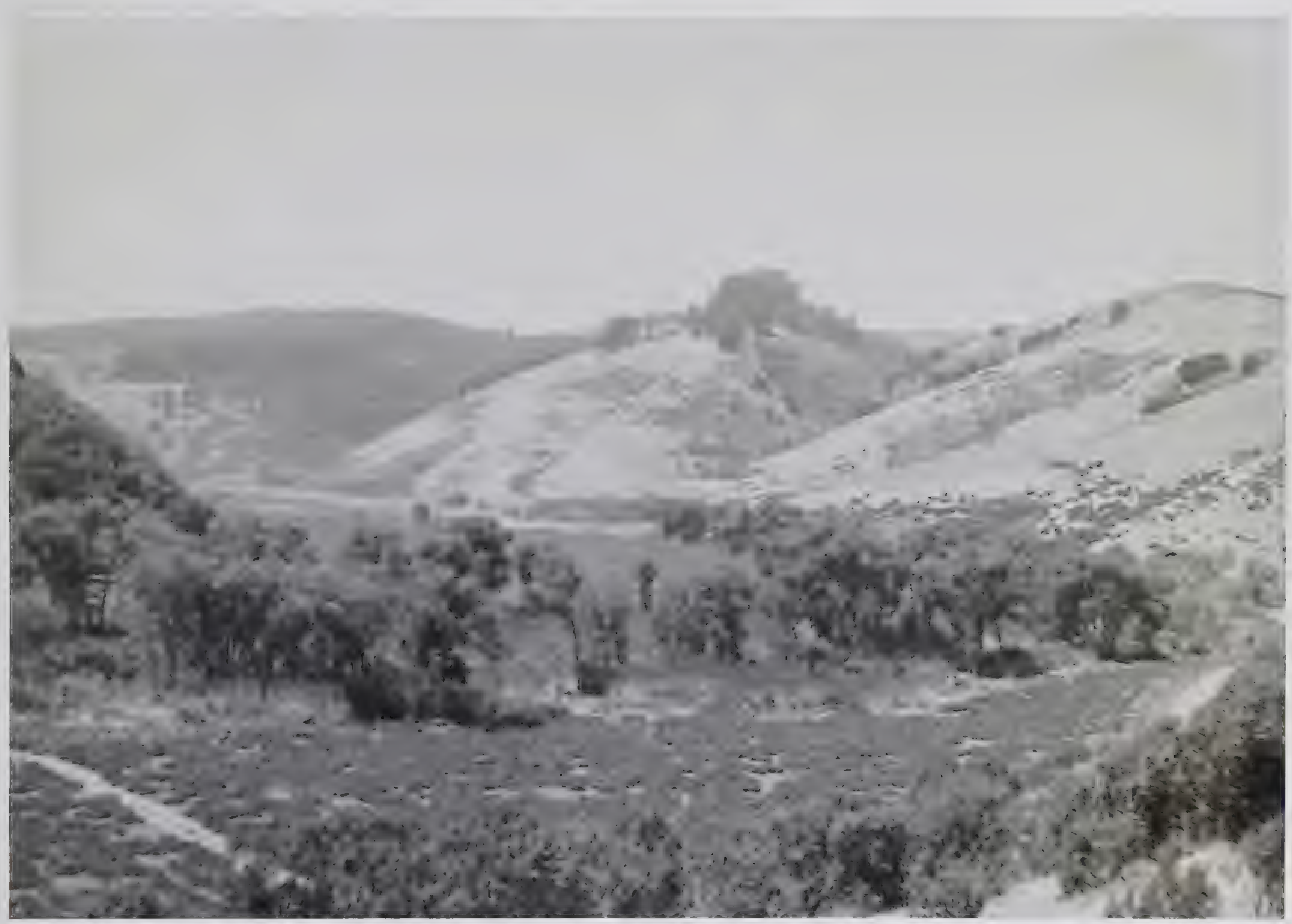
Incidentally, as I left the cage, Rhody popped in, and as I left was exploring the upper portion of the inner compartment, not having, evidently, fully comprehended that his intended victim had been spirited away under his very nose.

At 4:25 Rhody was gathering a sheaf of pine-needles in the inner cage. These he took directly to 5-36 without showing them at the mirror. He did not come down for an hour. He then made a thorough examination of the inner cage.

July 1st.

About 9 A.M., Rhody, then in the cage, followed to the shop

+See p. 1219A for picture of territory.



The country where Archie was liberated, June 30th.,1936, at the age of 1 year and 1 month.

He was freed at about the center of the picture. A stream flows along the line of trees. Lake Chabot is off to the left (West) out of the picture.

for a mouse. Part way there he cut across lots by a shorter route and reached the yard as soon as I did. This act would appear to indicate that he is capable of looking ahead to an objective andomit customary intermediate links in the pattern. I.e. he has learned that a mouse is to be expected when he goes to the shop whether he follows me all the way or not.

When he reached the gate on his return journey he gave a sudden start as if frightened by something, came back, began his ritual, then considered going over the wall instead of taking his usual route through the gate. There was no enemy in sight. At last he went out the gate and stopped at the lath-house, looking up, just as I had caught a glimpse of some small object running across its roof. He started to go inside, still looking at the roof, then changed his course and went around to a pile of boxes at the eastern end, under a pine tree. Here he seemed nervous, but soon came out, continued his ritual and carried the mouse to 5-36 via the mirror.

I then went to the boxes and a chipmunk ran out (only the second one seen at this place in 9 years. An escape?). Doubtless curiosity about this animal, with perhaps some element of fear, explains his departure from regular routine.

At 11:45 Rhody was at the boxes again apparently looking for the chipmunk. From there he went to the roof of the lath-house and whined. When I went to see how the snake was faring, Rhody came also, taking his time about it. He again whined. At first I thought that this whining might have something to do with his inability to find the chipmunk, but when I turned toward the shop Rhody followed and was given another mouse. This mouse was no smaller than those that Archie had to beat to death, yet Rhody killed him with one squeeze. Full ritual followed and at 12:12 he took the mouse to 5-36.

At 12:55 P.M. Rhody was sitting quietly in his nest as I approached. When I spoke to him he looked down at me, stood up and began to rearrange twigs and adjust the lining almost furiously, as if piqued at being discovered loafing on the job. This is about the nth time this has happened. I wonder what is really back of this behavior. Superficially, of course, it looks very human.

The point where Archie was liberated is 16 miles from here by the shortest road, but, due to the hilly nature of the country, is only about 9 miles as the crow flies. I went there again in the afternoon, seeing no signs of Archie, and talked to another of the patrolmen (Smith). He sees road-runners in the vicinity "every day", and likes them. Their antics amuse him.

From here to the place where we recaptured Archie is 5 miles by street, but, as the crow flies, less than 4.

Rhody still sleeps in the oak on the west lot.

Brownie, since his brood has grown up, now spends a great deal of time off to the south-west.

July 2nd.

Rhody from 8 A.M. to 11:30 A.M.

At 8 A.M. Rhody was in the cage, watching the magpies, who have now returned to his favor (or disfavor?). For the next

hour and a half this was his principal occupation. He then decided to follow me to the shop for a mouse, treating it with full honors. From the nest he sang his, now rare, full-song once.

In a half hour he was down loafing around where I was planting things. Suddenly he saw the chipmunk about 50feet away and headed for him. The chipmunk went up a tree and thence to the roof of the house. Rhody searched very carefully about the base, in which there are large cavities, making his flirting gesture with his wings. He then went up the tree and searched through the canopy, thence to the roof, across to trees on the other side, where he had to spend about ten minutes moving the twigs that interfered with what he seemed to think a good site for a nest. Tiring of this, he came down and went through a long series of ridiculous antics all over the place, during which he caricatured himself looking for something underneath the pile of boards. Being busy, I lost sight of him for a few minutes, until a soft hroo disclosed his presence nearby, watching me.

He again caught sight of the chipmunk at the same place and the previous action was repeated with the difference that he finally wound up outside this window on the terrace, where the chipmunk had arrived several minutes before him. The chipmunk avoided him by going down into an opening that surrounds the trunk of an oak that grows up through the stone paving. Rhody watched for him to reappear in a casual sort of way, and when he did, took his time about going after him. At no time did it seem that the bird really tried to catch the squirrel, and I do not think that that was his object. Nor did the latter appear to be really frightened at any time.

When it became evident that Rhody was losing interest I left the terrace followed by the bird, who came to the shop yard for his second mouse of the day. This one received full honors, including the mirror, and was taken to 5-36 at 11:30 A.M.

The chipmunk remained at the terrace eating the birds' food.

At 1:30 He was still there.

At 1:50 Rhody suddenly appeared on top of the cage with a snake in his bill. He obligingly came down close to me, laid it on the ground in order to get a better grip on it. He gathered it up, holding it in two places, so that one loop and two ends hung down. The loop hung about 5 inches below his bill, the head about 4 and the tail about 6. I am sure these figures are conservative. (Here's the chipmunk again). The length of the snake, making no allowance for the horizontal portions in the bird's bill, was, therefore, not less than 20 inches.

The creature was treated with full honors, including the mirror, bows, hroos, etc. and taken to nest 5-36, where the task of swallowing began at 1:55. (Note finished at 2:06, so the process is now in progress).

At 2:10 he was down on the ground again watching a wood-pile, as if looking for lizards, 30 feet from the base of the nest-tree. He "looked" as if he had swallowed the snake, but it seemed pretty quick work, and there was a possibility that he had left it in the nest for later consumption; so I got a long ladder, tape measure and a rule,(the tape to see how close my guess of 20 feet above the ground was). The nest is surprisingly well built. The flexible compositae stalks which I gathered for him and placed near the tree, have enabled him to build a structure with good curves. The bowl is elliptical in plan, 16 inches on major axis and 12 on minor, inside.

It is about 8 inches deep and is not very ragged on the outside. While I was measuring the height from the ground, which curiously enough, proved to be exactly 20 feet from the inside(bottom(of the bowl, a rustling in the branched by my ear announced Rhody's arival. He calmly settled himself in the nest and whined.

The bowl is lined only on the bottom, in the middle, principally with pine needles, although there is one small strip of an old sweater which I prepared for him.

There was no snake in the nest. The nest is fresh and clean. It is so commodious that Rhody looked small in it. Half a dozen more road-runners could be put into it.

As a rough sort of a test to see whether he might discriminate between persons, I sent Julio up the ladder. (Rhody knows him well) Rhody got out of the nest at once and sat 6 feet away. He would not return until Julio left.

With two mice and a foot and a half of cold snake under his belt, I thought Rhody would be inactive during the rest of the day and seek sunny spots in which to restore his calories to normal, but that is not the way it worked out, for he was, if anything more enterprising than usual. There is a section of sound-deading material,cosisting of a loose felt between sheets of heavy paper, lying on a waste heap ready for burning. Rhody took especial delight in pulling out the felt and throwing it away. The felt would make ideal lining for his nest, yet he has not used any of it. He also had one or two bouts with the rope end hanging from one of the awnings of the cage.

Most surprising, however, was his helping himself to a goodly lump of hamburger at 4:15 and gulping it down.

July 3rd.

Rhody, at 8:30 A.M. in the nest, whined for attention. About 9:30 he followed to the shop for a mouse. This he took to the nest with complete honors en route. In a half hour he was down searching the wood-pile where he first looked for the chipmunk.

A second mouse, given him late in the afternoon, went through all of the ritual except the mirror part. For the mirror Rhody substituted a window in the tool-house and the glass over the seed-bed.

July 4th.

At 8:45 A.M. Rhody took a thick, heavy twig up to nest 5-36 and remained there for a half hour.

On coming down he inspected the dormitory tree and the glass house, but decided upon Brownie's old nest site as a place in which to move twigs about and mew at me. He was especially vocal for about 10 minutes.

When he came down and got his mouse at the shop he carried out his full ritual, ending in nest 5-36.

I was absent the rest of the day.

July 5th.

Rhody came for his first mouse about 9 A.M.--full ritual: mirror and nest.

A little later he added to the nest, showing his material at the mirror first.

During the middle of the day and well into the afternoon he was not seen here.

He was given a mouse at 6:30 P.M., coming to the shop for it,

but abandoned it after going through a part of his ritual. Before doing this he stopped and appeared to think, then laid the mouse down carefully and went to see the magpies. Unless he eats it in the meantime, I shall test him with it tomorrow.

Brownie is now away in the middle of the day a great deal.

July 6th.

Much singing by Brownie in the early morning hours in the vicinity of the house.

About 8 A.M. Rhody was making an investigation under the dormitory tree near the pile of boards. The mouse had not been touched by him and, of course was swarming with ants. I knocked them off and held it up for Rhody to see. He merely craned his neck in order to see over the boards. Next he crouched in expectant attitude and stared under the boards. The chipmunk came out from under them about 8 feet away and Rhody made a somewhat perfunctory dash at it, only to have the creature dart under the boards again. Rhody made no attempt to find it, but when I placed the dead mouse about a foot from his nose, condescended to pick it up, drop it, and watch to see if it would run. This brought no results, so he swallowed it without ceremony of any kind.

An hour later he was found in 5-36 resting and greeted me with one whine.

Later he added a twig or two, first going to the mirror.

He is now showing a disposition to go to the mirror, carrying nothing, and taking a hasty glance at himself, at irregular intervals.

About 4 P.M. he had another mouse in the presence of a visitor (H.T.D.) of whom he was somewhat shy. He carried out his full ritual, but in sketchy fashion.

Brownie and his tribe were seldom seen during the day.

July 7th.

10:45 A.M. Up to this time Rhody has not been seen here, and the only evidence of B's existence was early morning song.

At 4:30 P.M., when I was looking for Rhody, Brownie was seen looking expectantly, from under the bushes, for an invitation. When one was extended to him, he lost no time in taking full advantage of it. As he sat on my hand it was noted that he is becoming somewhat shabby in appearance. I have not seen him much during the past few days, as he stays away most of the daylight hours.

6:15 P.M. Rhody was not seen at all until 5:45 P.M., when he entered the cage to stare solemnly at the magpies. He wanted no food of any kind, so he must have found plenty of lizards etc. while abroad.

July 8th.

Rhody came for his mouse to the shop at about 9 A.M.--full ritual. He was around most of the day. There was a surprise rain. In the fruit growing district near the south end of the Bay, it is said to be the first on this date in 63 years.

Rhody took refuge under his shelter at the old oak.

Late in the afternoon he was invited to the shop for a mouse; he came obediently, but seemed to think that the mouse was not a necessary part of the picture, and while he watched it run about, made no effort to catch it, soon retiring to his shelter, although it had ceased to rain.

Brownie is beginning to stay home more and brings Nova with him. He is sprouting new tail coverts.

He is slightly lame again--in the right foot.

His two mandibles are again of the same length.

July 9th.

Up to 11 A.M. Rhody has not been seen here, though he has been in the street and at the Scamells' and on the west lot.

Brownie (11:30 A.M.) has been back and forth between here and the territory to the east several times this morning, singing at both places. On his last return here he was followed by Nova. (I suppose it was she).

12:30 P.M. Brownie has been singing vociferously from a fence post to the west of my west line for the last half hour. He would not come to me and was apparently concentrating upon another bird down in the canyon. (Defending his eastern and western frontiers?) This song is not up to his highest musical standard, but it contains phrases that I do not recall having heard from him before, as well as familiar ones.

About 5 P.M. Rhody entered the cage to get meat. He took two pices of meat, which is unusual with him. I then got him a live mouse, thinking he probably would not have capacity for it and the meat too, but he gobbled it without benefit of ritual of any kind, and did not even go to his nest. He then left in the direction of his night roost without even looking at the magpies. I wonder if he has been looking for a mate so intensively as to overlook the matter of food during his absence.

About 5:15 Brownie came for worms. After he had all he wanted for himself he took two, held them in his bill and turned his head about looking for a customer, making his "blue-bird" call. This was followed by his whistle (consisting of three rapidly repeated, rising notes) ending with the kissing sound. In making this latter sound, the presence of the worms in his bill, keeping it partly open, did not interfere with the production of the sound at all, yet it is one which we associate with vibrating, plastic "reeds". While still at my feet he sang a soft, sweet sub-song, then moved ten feet to a low limb, swayed on one foot, and gurgled.

At 5:35 (now) he is singing full song from the direction of the old oak. It is not of the imperative quality of the one at noon.

July 10th. to 12th., incl.

Rhody hung around all day on the 10th., half the day on the

11th., and was not seen at all on the 12th.; not even at any of his three known roosting places as late as 7:35 P.M.

Brownie, on the other hand, is staying at home more and singing oftener. He has long periods of soft quarter-song and has resurrected his xylophone attachment with its clear, glassy tinkle.

His full-song is still not at its best, being rather staccato and, at times, inclining towards stridency with jay-like calls imperative in effect. It contains unfamiliar phrases , one of which can be approximated roughly by:

∪ ∪

—∪

Picky-yuri, or Picky-yuni, or Picky-oi-ri.

July 13th.

2:10 P.M. Rhody made his reappearance at 10:45 A.M., announcing his coming by a soft woo somewhere behind my back where I could not see him. However, in a few moments, he was seen entering the cage for a piece of meat. When this was disposed of, I invited him to take a young rat, which was gobbled without ceremony.

After this it was necessary to spread-eagle in the sun, since it was too warm for the open-bowl type of sunning. This was followed by resort to the shade to neutralize the effect of the insolation. When he finished panting there, more sunning followed and so forth, then preening and general loafing.

At 2 P.M. he was preening in the shade about 75 yards from the shop, but, on invitation, followed me closely into the shop, where I offered him a young rat. He merely looked at it and from it to me, as if to say that that was not what he wanted. He then went out into the shop-yard where the mice are kept in a large can on top of a stand about 3 feet high. Although he can not see what is in the can, he has been accustomed to see me open the lid and fish out a victim for him, standing quietly looking up at the operation. He now went there and stood patiently looking up at it. I took this to mean that he wanted a mouse instead of a rat, but, as a test, I took the young rat that he had just refused, and pretended to take it out of the can, laying it at his feet. He again refused it, hrooed softly and continued to wait patiently for something or other. He watched me remove the cover of the can (a long job, as it was stuck and required hammering) without moving from his place. I took out a mouse that was slightly larger than the young rat and placed it beside the latter. Rhody came forward almost at once and took the mouse, squeezed it and swallowed it while it was still alive, as evidenced by the fluttering of the feathers on the bird's throat.

Rhody now prepared to take it easy, but, catching sight of the chipmunk, chased it under the regular pile of boards from which it escaped while R's back was turned.

R next caught sight of a humming-bird feeding on gladiolus flowers about 10 feet away and proceeded to stalk it, belly to ground, but making no final rush to catch it.

His next move was to get a drink. I left to make this note.

All of the foregoing action within a period of 10 minutes.

The episode with the rat and the mouse bears more than a mere superficial resemblance to an act of intelligence in which the bird managed to convey to me its undoubted preference for

a mouse over a rat at this particular time. It is, of course, not necessary to assume that the bird "reasoned" about the matter at all, or that it consciously endeavored to convey its desires to me, or that it had formed a fixed determination that it wanted a mouse and not a rat, or that it has any subjective conception of the difference between rats and mice; but the fact remains that it refused the rat, even when there was no mouse visible as an alternative, and that it went to the place where it had learned from experience that mice are kept, and there waited until its mouse preference was satisfied. Only mice are kept at that place. But mice are also kept in the shop and Rhody has taken both rats and mice from me there. There is a suggestion here that he is aware of this distinction and that he went to the mouse placein the knowledge that only mice came from there. However, I do not insist upon this interpretation of his behavior.

The physical facts bearing upon this episode and which may have been at the bottom of it all are:

(1) Rhody was not very hungry. He was not in need of food.
(2) The rat was white.
(3) The mice were not white, but a little lighter than the usual mouse color.
(4) Practically none of the natural food of road-runners is white. (?)
(5) Rhody, Archie and Terry have always, unless very hungry, accepted white mice less readily than dark ones.
(6) The young rat offered was about the same size as the mouse; hence size cut no figure.

(7) The rat, when(as far as Rhody could tell) abstracted from the mouse can, was still refused.
(8) The mouse, plced along-side of it, was taken.

Hence the choice of food, in his not-very-hungry state, was based on color. (?) So much for the matter of choice; but we are still left with at least apparent knowledge on the part of the bird that there was greater certainty of securing the food preferred at the moment at one place rather than the other. This would seem to imply ability to learn and arrive at some sort of a weighing of certainties against uncertainties as a basis upon which to act. But I do not insist upon this interpretation either.

July 14th.

Rhody was around the place all day. His interest in his nest and the magpies was negligible; in fact he did not visit the nest at all.

He was given a mouse and a rat during the day, but did not display for either.

July 15th.

Rhody had his rat in the morning, without display. I was absent during the afternoon until about 5:45 P.M. Julio says R was not seen, although looked for, during my absence.

On my return I sat in the shade near the oval lawn reading Sutton's chapter on his pet road-runners, in his "Birds in the Wilderness", which I had just obtained. I was mentally comparing the behavior of his birds with Archie and Terry's when a rattle-ooo sounded off to my left and Rhody appeared in the driveway near-by--an odd coincidence. When he came up to me he was the dustiest

bird I have ever seen. FRom the tip of his bill to the tip of tail and toes, back, sides, crest, skin-patch, everything, he was covered with dust so completely that he was an almost uniform dun color. His meek appearance seemed to imply a consciousness of his temporary lack of pulchritude.

When I invited him to the shop he followed part-way only, evidently not very hungry. However I took a young rat to him. He merely looked upon it as one of the commonplace phenomena of nature and not worthy of special attention. A very small mouse, just able to walk, was offered next; he did not really want it, but, as an accommodation to me, he condescended to eat it. Despite its insignificant bulk it would not go down easily and required repeated swallowing efforts to keep it down when once it had arrived at its final destination. Rhody must have filled himself all the way to his gills earlier in the afternoon. (The mouse was "mouse-color"; the rat was white).

After this Rhody had to lie on the ground for a long rest. I talked to him and he got drowsy and drowsier; his lower lids crept slowly upward; his muscles relaxed; his head drooped, but each time this occurred, he recovered and looked around, occasionally glancing up at me with narrowed eyes in dreamy, speculative fashion. I left him there by the west fence, whither he had gone en route to his sleeping place.

The habit of the road-runner in seeking a roosting place exposed to the last rays of the sun, seems to have been acquired in a very logical and natural way. As the shadows lengthen and the air cools, the bird moves into the sun. It follows the sun. What is more natural than for it to climb a tree and get its last beams while disposing itself for the night? Especially in the cooler portions of its range near the sea.

It has been repeatedy recorded in these notes that Rhody and his tribe use the "open bowl" pose in sunning when the air is cool and the "spread-eagle" when the air is warm and the sun hot. The second pose is used under conditions where the bird normally seeks shade. While he often preens after either pose, the flat pose is often followed by savage scratching of the neck and head with the feet as if the intense light and heat had driven vermin from the relatively exposed back (where Rhody can not scratch) to portions of his anatomy more accessible . However, I have never detected parasites (except one of "the" flies) on any of the road-runners. If this is one of the reasons for sunning it parallels what I have supposed to be the case with thrashers.

July 16th.

Much early song by Brownie. When he had finished after an hour or so I saw him on the lawn below from my bath-room window. He readily responded to call, climbed a convenient tree and hopped over to sit on my hand and dig worms out of the tin box. He doesn't care how much, how little or what I have or have not on.

Rhody, about 9 A.M., wanted nothing from me, but, at about 1 P.M., thought otherwise and came running at unusual speed, following me ~~to the shop~~ into the shop. (This time all rats and mice were outside in the yard). He seemed puzzled at my not offering him something and looked significantly at the movements of my hands. I crowded past him and fished out a young, white rat. He was disappointed and went and stood in front of the mouse place.

I pressed the rat upon him, but he would have nothing to do with it and started to leave. When I stepped to the mouse apartment he reconsidered and waited . There was no hesitation at all when I gave him his choice. He took the mouse and gobbled it without ceremony. It was not white like the rat, but of practically the same size.

He continues to ignore his nest and the magpies. He is undoubtedly on the downward slope of his nesting curve.

July 17th.

Rhody was not seen here until about 4 P.M. when he glided past my feet like a ghost on his way to get meat from the cage. He would not stop when I spoke to him of rats and mice, but after eating his meat, decided to watch the magpies. Tiring of this he mounted to his "arm-chair" shelf and composed himself for a good rest with tail resting on one arm and bill upon the other.

After about 10 minutes of this one of the magpies began to "sing" just behind him. Rhody replied with beak-rattlings, dropped to the perch near the wire for a better look. The magpie, although not more than a foot or two from Rhody, continued his song without shifting his position and in no way appearing to recognize the presence of the road-runner. Rhody went from perch to perch around the corner to see if there was not some way to get closer to the magpie, all the time rattling his beak and displaying with bill close to the wire. It was a magpie-roadrunner duet. This lasted for about 5 minutes and then Rhody decided to come out and see what I had to offer, which was: a young white rat. He took it, killed it, seemed to consider whether he should bow and hroo; decided against it; ran toward the mirror; decided that was not in order; trotted to a place in the sun (he had been in shade all this time) laid the mouse down, turned back to the sun in the open-bowl pose. I said to him:" It is too hot for that pose, you have made a mistake", and I was right, for he abandoned it almost at once for the spread-eagle. I took a still picture of this. (Distance, 10 feet, 1/50 sec, f.6.3-- a rather large stop in order to the shadows if possible).

On recovering from his sun-fit he ate the rat (after a good scratching of his neck) then stood in partial shade with wing tips touching the ground and began to doze. About 20 minutes of this and he began to stir about a little. The shadows were getting long so I said: "Don't forget that it is time to dust". This was also a good guess. Voices from the street now caused him to head off toward the west to avoid suspected danger; he does not like "unseen" voices at all. I followed him to see if he would try to get a look from a safe point at the origin of the sounds, but he did not. He went down the lower road, out into the street by the Scamell house where all the world could see him, and did his open-bowl sunfit (it was now cool enough) until an approaching car caused him to head for the west lot. Since he was full of food there was nothing further to be done but wait for bed-time, so I left him.

July 18th.

Rhody did not appear until about noon; and then he trotted behind me, up the road to the shop. Here he had a white mouse--no display of any kind--no going to the nest.

About 5:30 P.M., he having remained hereabouts all the time, he again accepted my invitation to come to the shop. I offered

him everything from a fairly large, young white rat down to a very small mouse of ordinary color. He wanted none of them, but seem to take an interest in my display of mammalian resources and hung about indefinitely. Perhaps he is studying man and his parasites and will communicate his findings to the road-runner world through whatever medium seems most appropriate.

Brownie, who has not yet quite reached the maximum of shabbiness, is staying home more and singing more. There are signs that indicate the coming of the local, annual convention of thrashers. I have not checked over back notes to determine whether this is the right time; but he is going up into high trees where meetings were held last year and calling to all points of the compass loudly. In these calls he is occasionally inserting his new _picky-yuri_ phrase, developed this year. I am positive he did not have it last year. He is also beginning to follow up these somewhat staccato, articulated "words" with unaccented, rolling warbles having no pronounced rhythm. This was characteristic of last year's conventions. So far I have observed no response to his efforts, other than that they frequently induce Nova to come from somewhere and answer with her peculiar high-pitched voice, especially when he sounds his _whistle-kiss_ or his _purple-one-two-three_.

(I will now look up notes and find when "conventions" were noted last year. I think it was in August).

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I will tabulate observations bearing upon this point from last year's notes and see where we arrive:

Sub-song cycle reappearing...... (Compare July 10-12 notes 1936).	about July 12, 1935.
Long sub-songs.................	" 16-17, '35.
"Relaxing territorial claims".......	Aug. 9-12, '35.
"Calling other thrashers","Assembled Nova and two others".....	Aug.13-16, '35.

It looks then as if B's present activities will lead up to conventions as in 1935.

July 19th.

From early in the morning until about 9 A.M. Brownie has been repeating activities noted above, Nova the only one responding.

Rhody was not in his night roost at 6:45 A.M., nor was he to be found here, although that does not necessarily mean that he was not here, for he is practically invisible if he does not definitely want to be seen.

The Clay Feet of the Idol.

I went out to locate Rhody, after having been busy for several hours, at about 4 P.M.

First, I found a neat pile of feathers not far from the cage, but no Rhody. Examination of the feathers indicated that they were from a young bird, probably a brown towhee. I was about to give up the search when Rhody stepped placidly out of the bushes near me and picked up a young towhee partly denuded of its feathers and began to complete the job. Since this is a veracious record, I went to get the movie camera to record the frailty of our hero despite my aversion to advertize it. On my return I found he had attempted to swallow it while I was away, but that

it was too big--one of his few over-estimates of his throat calibre--and had abandoned the attempt, leaving a coating of saliva which indicated that a little beyond the shoulders was his farthest South. As a"reward" I got him a young rat which he disposed of in no time.

The evidence that he caught the living bird and killed it is only circumstantial, but there can be little doubt that that is precisely what he did.

As far as I am concerned he can have all the towhees he can catch--there are too many of them here--if he will "lay off" of the other birds. This place is out of balance towhee-wise anyway. 12 to 15 nests per year on a place this size are too many.

At 7:15 P.M. I went to see if he was in his night roost in the oak of the west lot. He was.

July 20th.

I did not see Rhody until 1:15, when I found him under the trees near the cage. Unless he is in the cage, or on top of the observatory roof, finding him is more or less of an accident.

When I headed for the shop he booed as if to make sure that I had not overlooked him. I kept on and he booed again. He then decided to follow. The first offering was a young white rat large enough to run about a little. This aroused no enthusiasm whatever. A younger one of the same kind with eyes not yet open was then put before him. Rhody merely glanced at it waited patiently for more acceptable offerings. Next I produced a smallish white mouse, selcting a white one instead of a gray one purposely. He reacted to it at once, squuezed it once or twice and swallowed it while it was still kicking. This was a mistake. It was too much alive, so he disgorged it hurriedly and"killed it some more". It was still alive when it disappeared permanently.

Next Rhody discovered one of his own wing feathers in the road and fussed with it a half minute. Object unknown. Next a sudden dash into the glade, where I followed and sat down. He strolled up to me slowly looking pointedly all about his feet for the worm that I might have tossed and he overlooked. An old trick. I happened to have no worms, so he went back to the road and gathered pine needles, but instead of taking them to the nest--a thing he has not done for several days--he went off on one of his fantastic series of ground evolutions through the bushes.

Until 3:45 he preened and loafed and caught dexterously worms which he had shown me he wanted and I went and got for him. (Three still"shots" of him, 1/100 sec., f.6.3, dis. 6 to 8', in an attempt to get him with raised crest and colors displayed).

He booed as he arrived where I was sitting-- I had expected him to come as I did not think the one mouse would satisfy him long. He followed to the shop where I gave him another white mouse.

He performed none of his ritual with any of these mice. It has been several days since he has sat in his nest. It seems to be entirely out of his mind.

July 21st. to 24th., incl.

During this period Rhody continued his present policy of remaining away during the forenoons and reappearing sometime between 1 and 2 P.M., sometimes later, and then remaining until about 6 P.M., when his slow march to his night roost in the oak

on the west lot began. He was not seen to visit nest 5--36, or any other nest, at all; and he made no display in accepting mice. The young rats are now taboo--perhaps because too large. Inspection of the magpies became less frequent. The wane of his mating urge for the season probably has caused him to lose interest in them, just as he has lost interest in nesting activities.

Coincidentally, or probably in consequence of his decreased preoccupation with affairs of the heart (really, I suppose, diminished excitement of his gonads) he can give more time to foraging, hence is less dependent upon artificial food supply. Certainly his natural wild food supply is now abundant.

On the other hand, there is the possibility of his having an active nest somewhere else, and his absences are an indication of his taking his turn at household affairs. In that case, however if he followed the pattern of last year, he would not sleep in his regular roost--unless the nest were nearby. I have several times prowled through the thick growth of the west lot at times when he was not here and have seen no signs of him then or of any nest. I do not think he has another nest.

Brownie continues to sing, principally in the early morning hours, but there has been no further evidence of his intention to call the annual thrasher convention. Perhaps the singing commented upon a few days ago served merely to notify other thrashers to stand by and be prepared to actupon official notices to be broadcast later.

July 25th.

At about 11 A.M. I sat in the shade wondering if any of the foregoing hypotheses as to his morning non-appearances were valid when Rhody suddenly dropped down from a tree and began a prolonged spread-eagle sun-bath, thus interrupting the sequence upon which the theorizing was based. Advantage was taken of this opportunity to make another attempt to get a record of his colors with motion picture camera. To date none of these films has shown the true values . (Kodachrome film; distance 12 feet; 1" lens; stop half way between f 5.6 and f 8; footage 4 to 5; brilliant sun; 11:05 A.M

The sunning, as is usually the case, was followed by violent scratching of the neck and throat. Then rest in the shade; then catching tossed worms. During this action a centipede was picked up at my feet; one toss, a "glup" and it was downed without being killed.

One shrill squeal from a child in a new home about 100 feet behind me, and Rhody, after making two quick steps and turning his back to me, froze, crouched low to the ground, feet extended out in front, tail flat along the ground.

For 8½ minutes (actual timing) there was no movement, except of the eyelids winking. Thenas a milk truck came up the driveway passing 20 feet in front of him, the road being 7 feet lower at that point, he tightened up his feathers slightly, but made no movement of head or body.

At 10 minutes elapsed time, the truck which was standing at the back door about 50 yards away, began noisly to return. At the increased volume of sound R crouched lower; otherwise not moving. The truck passed him again with no further sign from him. A few seconds later he relaxed somewhat and turned his head in the direction of the house, from which children's voices were barely audible to me. I moved about, but he did not react.

He gradually resumed his original frozen posture of head, but was not so tense.

At 17 minutes elapsed time I returned with a mouse, finding his pose unchanged. The mouse was put on the ground 18 inches from his bill. He merely rolled his eyes slightly. The mouse began to prowl about then dug under the leaves, disappearing completly from the sight of the bird. R watched the spot where the leaves stirred 3 feet away from him. The leaves ceased to move.

At 24 minutes elapsed time Rhody stood up, stepped quietly over to the mouse's place of concealment, appeared to listen, then delivered one swift stab down into the litter, neatly withdrawing the squirming, squealing victim. A squeeze or two and it was limp. R now raised his crest and seemed to consider whether not he should begin his ritual. He saw the mirror 25 feet away, turned and ran toward it, hesitated, changed his course and gobbled his prey without ritual. Thereafter more sunning and loafing. The rest of the day was spent in sunning and preening mostly until time to start for his roost.

July 26th.

Rhody again was not seen here during the forenoon, but when he came in the afternoon, promptly accepted an invitation to follow to the shop. One loud, sonorous *boo* as he joined me no doubt was intended to make certain that his presence would not be overlooked.

After this tactful reminder there was nothing to do but to hand him a mouse, which was gobbled without ceremony of any kind. The inevitable sunning and preening followed. Julio appeared at this juncture with a live lizard. Rhody merely wanted to play with it, picking it up several times without seeming to hurt it and putting it down again waiting for it to run, circling about it. I did not wait to see the final outcome.

The curious habit of playing 'possum of these blue-bellied lizards and their absolute non-resistance when in the bird's bill have been commented upon in these notes previously. It almost looks as if the lizard did not object at all to being eaten. Another strange habit is that, when released in the presence of Rhody and before being touched by him, one can pick them up usually without their trying to escape, whereas before being introduced to the Presence, they are extremely difficult to catch, except by stealth.

July 27th.

About 10 A.M. I went into the cage not seeing Rhody anywhere; but a confused blur,followed by a light thud at my feet, resolved itself into Rhody sailing down from a perch somewhere in the inner compartment; his objective being the freshly trapped house-mouse which I was carrying by the tail. I should not have known that he was about if he had not made his presence known. No doubt there have been many times when he has been reported absent while actually on the job but out of sight. He had two more mice during the day. One very small.

July 28th. to 31st., incl.

During this four day period Rhody was not seen on two of the days at all (28 and 31). The other two days he was about as usual.

On the 30th., for some reason or other, he spent a lot of time close to the house, and was so tractable that I took the opportunity of trying out a Graflex camera on him--a camera that I have not used before--using shutter speeds all the way from 1/100 sec.

down to 1/500, both inclusive. He sat on chairs, walked in and out of the house, sampled the quail's scratch feed (a new act), peered into the windows, posed on the sills, etc. Naturally he also preened, since, at the present time, this is one of his principal activities. He is still pulling out feathers . In the aggregate, he must spend several hours a day working on his feathers. His rate of moulting is such that he never gets so ragged as Brownie.

August 1st.

About 9 A.M. Rhody entered the cage to get a freshly caught (and dead) house mouse; then followed work on his feathers, still (9:50) in progress. (Took three "shots" of him at 6 feet distance --the shortest distance to which this 3A Kodak will focus--all 1/100 sec., f:6.3). (See 1233-A

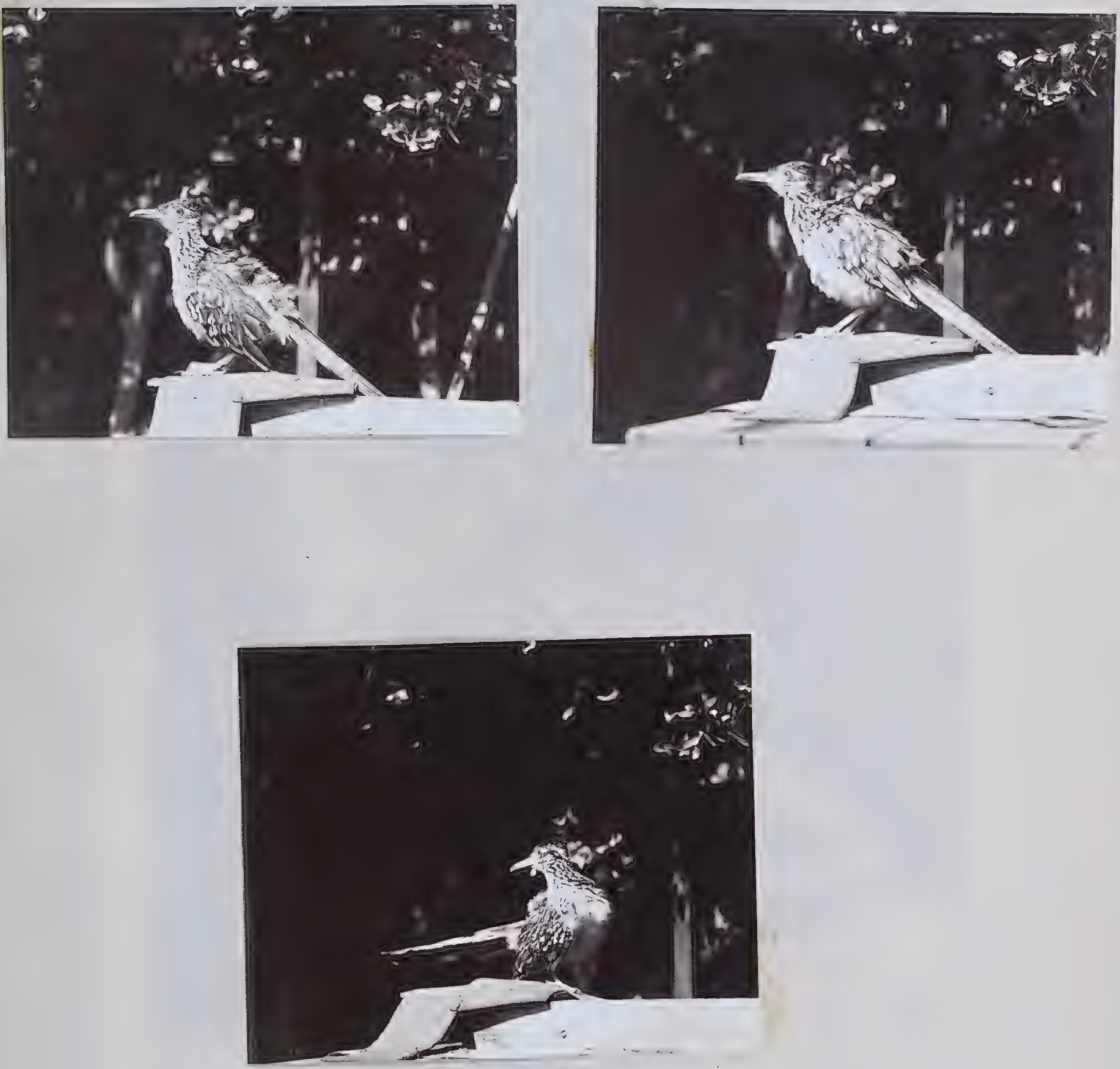
At 10:05, after looking all about for Rhody and deciding that he was off again, I happened to spy him up in the upper annex of the cage,built for Archie and Terry, taking a good rest, dozing and apparently at peace with the world, and not preening.

It may be only a coincidence, but yesterday I raised one of the awnings covering the west side of this annex, thinking that it might make the place more attractive to Rhody, and hoping that he might come to regard it as a refuge in inclement weather and a good night roost.

For a month or more Rhody has been using a certain acacia. (one of 15 or 20 planted but 5 feet apart along a certain section of the north boundary line) in which to rest and preen, usually in the afternoons, but sometimes in the mornings. These acacias are all of the same species (Acacia latifolia) require little water and get none except during the rainy season. Their foliage is somewhat sparse--in this particular location --at this time of the year--on account of the dryness. Consequently their shade is not very dense. The one which Rhody selects almost invariably differs, as far as I can see, from the others, in having a somewaht more nearly horizontal habit of its branches and a trifle denser and greener canopy. The horizontality of the branches offers more comfortable perches and the dappled shade seems to provide the optimum conditions of temperature and sunlight for encouraging long periods of repose--under present prevailing weather conditions

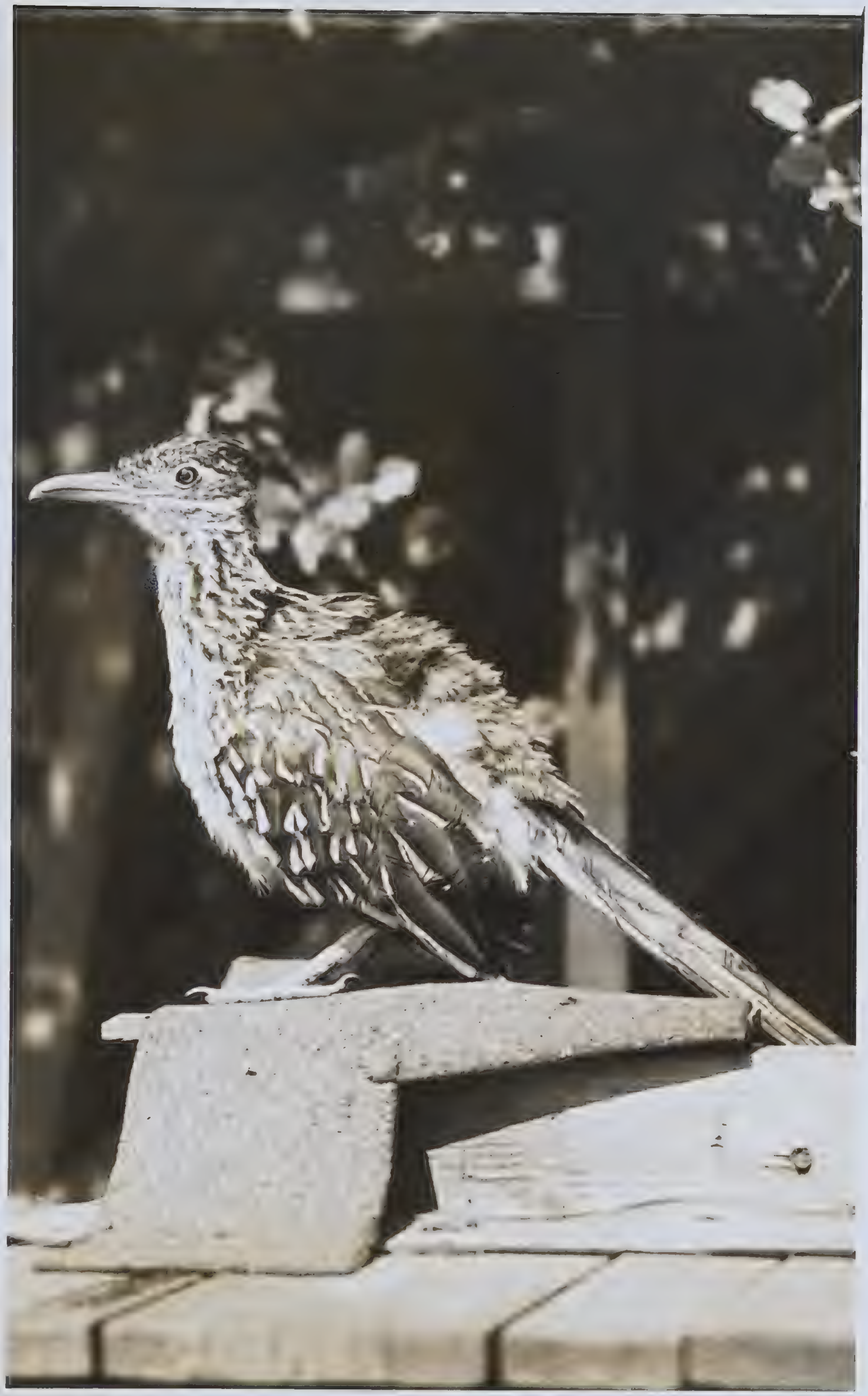
More specifically, bearing in mind a peculiarity of this summer climate: hot sun and cold shade, Rhody, in order to be comfortable, finds no necessity, while occupying this tree, to make frequent shifts from shade to sun and vice versa, with shade temperatures ranging between 70 and 85, approximately. At least his behavior coordinates with this hypothesis. (Incidentally the official Weather Bureau published maximum temperatures of this vicinity have, for several weeks, been showing maxima in Oakland running from 6 to 15 degrees higher than in San Francisco).

In about half an hour Rhody came out of the cage, walked rapidly by me with crest raised, colored displayed, head, neck, back and tail all in a horizontal straight line, and proceeded to play peek-a-boo with an invisible partner about the bushes near which I was sitting. Object unknown. Next a long inspection of the sky. I could see nothing in it--not even clouds. I do not remember having on any previous occasion been unable to see any object in the sky that has attracted Rhody's scrutiny.



Rhody preening on the circular-saw bench, Aug.1, 1936. Dis. 6', f:6.3, 1/100 sec., 3A Kodak.

1233-B.



Next a long spell of rest and preening in the tree above referred to. This time he removed feathers from his back and watched them fall down through the branches with a comical air of surprise.

About 1:30 he followed to the shop for his second mouse of the day.
About 2:30 he came down from his tree to catch worms tossed to him.
At about 5 he had disappeared. I suspected he had gone to the west lot, so went to the fence and called. He soon came out of the brush and reached for worms through the wire fence. As he seemed hungry I went and got him a mouse . When he saw me returning and noted what I was carrying, he crawled hastily under the fence, came up the wall to meet me, booed and took the mouse. He still hung around, so I went and got him another small one. This he also gobbled. Four mice today--though none of them very large.

August 2nd.

Rhody maintained his present standard of behavior, including his recently acquired habit of using the upper annex of the cage in which to rest and preen. One mouse today. Usual roost.

Brownie as usual. No evidence pointing to resumption of thrasher conventions.

August 3rd.

About 10 A.M. Rhody was found in the upper annex of the cage, having just eaten meat from his dish. After a long rest and preening spell he came out to investigate the doings of a young English sparrow at one of the feeding stations on top of an isolated pole about 7 feet high. As he flew up the sparrow departed.
About 11 he was offered a young rat, but he chose to go up into his favorite acacia. When an alligator lizard was released about 20 feet from his perch and began to run, R could not resist the temptation and came down. This lizard wanted to fight. R after finding that the lizard would not respond to the same tactics as the blue-bellied lizards and was "onery", abandoned all idea of sport and beat the creature unmercifully upon the ground. During this operation the rest of its tail came off. (It had previously lost a part of it; hence it appears that there is more than one point where the lizard can break its tail).
Both ends of the lizard now looked about the same and this may account for the fact that Rhody now swallowed it tail-end first--the first time this has been noted here--without any difficulty whatever, notwithstanding the ratchet-effect of the backwardly-pointing scales.
The tail, which had been whipping about on the ground, soon followed the course taken by its original possessor. R made no attempt to "kill" it.

Brownie, now (11:30 A.M. singing beautifully near the oval lawn) was heard scripping over at the Robinsons' about 8:30 A.M. Whistling his "purple, one-two-three" call brought him home and to hand.

August 4th. to 6th., incl.

During this period there was no departure of consequence from present routine either on the part of Rhody or the thrashers.

The Convention of Thrashers has not yet materialized as observed in 1934 and 1934. Brownie sings full song at irregular intervals, and the same may be said for sub-song. The latter is now, at times, of long duration: an hour or more continuously.

Rhody continues to favor his resting places in the cage aand the same acacia.

On the 6th. it looked as if he might resume his nesting work, for a few moments at least. The impulse came to him, but faded out. He had been resting quietly in the cage for an hour or more and, upon coming out, performed his ridiculous series of loops, spirals and other complex curves through the bushes to the accompaniment of beak-rattlings and rattle-boos apropos of nothing within the range of my senses, then devoted himself to the collection of a large sheaf of pine-needles. This he took to the mirror for inspiration; but there, after pressing it against the glass once, it was dropped in a casual sort of way and he turned to sunning himself in the spread-eagle pose.

A little later he was invited to the shop for a young rat. He picked it up without enthusiasm and dropped it twice, then turned to wander off after waiting for further developments. When I got a mouse for him--also white--and practically the same size as the rat, he came back at once and gobbled it without ceremony. There seems to be something besides color to influence his selection.

About 4:30 P.M. a visitor (H.L.E.) and I were sitting in the shade of No.5 nest-tree watching him lying on the ground about 20 feet away, also in the shade, at peace with the world. After a half hour or so he got up and approached us along a path, but suddenly dashed past us with incredible speed, looking more like a line in space than a bird, and disappeared for the rest of the day. The cause: three boys approaching the fence from the north, not at all noisily.

August 7th.

When offered the same rat today he swallowed it without hesitation, alive and kicking. His throat and shoulder feathers continued to move about for several seconds.

2:30 P.M. At a shadetemperature of 83 degrees, Rhody sits in the shade with lifted wings, while Brownie sings under-song in the glade.

At about 7 P.M. Rhody was not in any of his known night quarters. I learned from Mrs. Scamell that he had, a few days ago, entered Mrs. O'Neill's bed-room early in the morning while that lady was still in bed. Since there is an acacia tree (Acacia melanoxylon) close to the west wall of the O'Neill house (275 yards due south of here across a small valley) and the tree would seem to offer all the requirements of a road-runner roost--including the unobstructed western outlet and the landing field with protection from the rear--I went over to investigate. It seemed probable that he might have been using the tree as a roost and discovered an open window nearby that required investigation.

Mr. O'Neill and I examined the tree, but could not see him, but the expected window was there and a branch of the tree almost touched it. This window was the one through which he entered the room. Mrs. O'Neill said that, while lying awake about 7 A.M. (about the first of the month) she heard rustling in the tree and Rhody appeared at the window, carefully stepped over some potted plants on the sill, entered the room and perched on a chair, looking all around him curiously. When she stirred slightly to get a better view he left quietly, again avoiding the plants.

August 8th.

At about 7:30 A.M. I looked off toward the O'Neill house. Rhody was out in the field in front catching insects, probably grasshoppers. I went out in the street to a rock about 125 yards from him and called. He responded by moving slowly in my direction--down, then up the hill--5 or 6 feet at a time, not overlooking opportunities to catch insects. He had to come up a steep bank to reach me. At the foot of it he began to look about his feet for the worms that I had *not* tossed to him, came to the rock and caught real worms expertly, finally sitting within arm's reach, taking them from hand. During all this time he had not uttered a sound. When I left he refused to follow.

At 1 P.M. he was back here wiping his bill upon every convenient object interminably--a sure sign that he had been in the cage eating Hamburger. R, A and T always did this very thoroughly after eating raw meat, even though it had not come in contact with the outside surfaces of their bills. He next sought his perch in his present day-time acacia, rested there for a few minutes and then came to see what I had to offer. I got him a medium sized mouse--eaten without display.

Next sunning was in order--spread-eagle only, since it is hot enough. Thereafter preening and resting in the inside of the cage until 2:30. At that time he came and placed himself in front of me where I sat in the shade. This proved to be a hint that he wanted another mouse, so he trotted happily after me to the shop, where he had another medium mouse. This one kicked too hard when he got it down, so he disgorged it, gave it another squeeze and swallowed it, still kicking. Instead of going away, he stood stock still for several minutes. I got him a very small mouse. This creature went to Rhody and sniffed at his feet. R merely touched him with his bill and went to look at himself in the tool-house window.

There he managed to acquire,, by accident, a leaf hanging six inches below his bill by a spider-web. This puzzled him, because when he turned his head, the leaf swung into view and when he lowered his head to look at it, the leaf went down also. He made no attempt to remove it, enduring the affliction phlegmatically, and when he finally walked away, the leaf fell off.

Later in the afternoon he came out of the cage,where he had been resting and preening, to where I sat with a visitor. I think he really wanted another mouse, but was overawed. I made no move to get one for him, and whetehr or not that was the inciting cause, he proceeded to clown about with rattle-boos in our immediate vicinity, finally darting off,as if in disgust, to preen in the shade.

August 9th.

The first paragraph of yesterday's notes applies almost

precisely to my first meeting with Rhody this morning, the only difference being that, this time, it was 9:30 A.M. Instead of returning here at once, I went on over to the O'Neill's, finding that Rhody had not been seen in their acacia tree last night, thoug looked for.

On my return here Rhody decided to follow to the shop, where I gave him two mice--one of them small.

He did the usual things until about 5 P.M., when he came for a third mouse, then disappeared. I anticipated, that, being well fed, and the sky being overcast, he would probably retire early. Accordingly I went to his oak in the west lot, but he was not there (At about 5:30). However, he evidently had an eye on me, for he came running from the field to the south, planted himself in front of me with feet spread and tail braced on the sidewalk, and prepared to catch worms on the fly. After catching 20 or 30 expertly he looked in the direction of his night roost intently, as if he had heard something alarming there, then walked toward it slowly, disappearing in the underbrush. At exactly 5:51 he jumped across the space separating it from the adjacent tree, but it was a minute or two before I could actually see him, composed for the night. So he has not made a permanent shift, and it may be that he has not even made a temporary one. (Sunset 7:10).

It seems that it was an early retirement, as expected; but I have not checked up on this phase of his behavior recently.

August 10th. and 11th.

No new manifestation on the part of Rhody during this period, although, on the 11th., he was not seen here until about 4 P.M., at which time he sailed down from the acacias along the north fence and trotted directly to me in expectation of benefits; so I headed for the shop closely followed by the bird. This time, one mouse was all he needed.

August 12th.

At 7 A.M. Rhody was not in his night roost, nor could I see him but in the field at first. In a few minutes he stepped out of the shrubbery, about 200 yards to the south, across the street from the O'Neill house. At this time of year this field is covered with short, dry stubble (straw colored) with a scattering of green weeds. This is essentially Rhody's color scheme as viewed from a distance of a few yards. Against this back-ground, at a distance of a hundred or so yards, or even 200, about all one sees of him is a "black" tail sloping up at about 45 degrees, and a small, black, acute triangle (representing his head) with base toward the tail. These two objects move about together, but otherwise, depending upon the distance, nearly separate entities.

I went over to see him and found him pleased to catch worms on the fly, but totally ignoring a stink-bug that crawled about at my feet and stood on its head when touched with a straw. That is: Rhody, although he looked at the bug, made no effort to catch it.

Next he went south across the street to inspect the interior of the Wickland's living room through the window, without display of any kind. At the present time, this is his attitude toward all closed windows, as well as mirrors.

He then returned to the field, but did not follow me, and when I looked back, had discovered something interesting in the

field--was flirting his wings at it and walking around it in true road-runner fashion.

Mike, the laborer who works on the upkeep of the lawns and shrubbery in the parking of the tract, who was present, says that Rhödy had, but a few minutes before, come from the vicinity of his night roost in the west lot; so his presence near the O'Neills' was not an indication that he had slept there.

Speculation on hody's present ehavior.

At this stage of Rhody's life cycle, there seems to be no powerful motive impelling him to remain fixed in any particular limited area, such as the vicinity of his nest or the cage. Hence his wanderings now are more or less casual, and since food is abundant all over this neighborhood--lizards, snakes, insects, etc.--he forages in random fashion. The certainty of food here, in unlimited quantity and of particularly attractive nature, however, seems to keep him within comparatively narrow limits of range. Added to this is the very important item of assured water supply, and probably also the potent influence of familiar environment with its known hazards and refuges and , perhaps, amusements.

Rhody Mobbed

Wrentits find Rhody. Scold.

At precisely 9:15 A.M. Rhody went up into his present favored acacia tree for a rest. Wrehtits located him at once. I stood 9 feet from him. He sat less than 6 feet above the ground. The foliage of this tree is sparse, so I could see everything plainly. Soon the wrentits increased in number to four, all scolding. They approached to within four feet of him, from the rear, as a minimum distance. A Vigor's wren now perched four feet below him, scolding.

Wren joins.

Notwithstanding this clamor, Rhody gave no sign whatever of being aware of their presence and remained comfortably settled upom his small limb.

Anna hummer comes.

Shortly an Anna Humming-bird arrived, "snipping" excitedly and darted all about him, front as well as rear, reaching to within two feet of his bill, in front. (In judging distances I had the wire fence of known mesh to guide me. Rhody was six inches above the top strand). This hummer was joined by three others: one Anna and two Allen's. All "snipped" and darted at him. Rhody from the arrival of the first hummer, was acutely aware of their presence, crouched still lower and kept his bill pointing at one or another of them, but never shifted his location. The Allens were persistent in approaching from the rear, only. The Annas; from any direction, even defying Providence by hovering directly in front of him at less than three feet distance. One even sat on the top strand and preened at about 2 feet 6 inches (Allowing for parallax) from the tip of R's bill. Rhody "flattened out" for this one, but did not attack. Others of the four at times perched from three to six feet from him. All disregarded me.

One more Anna and two Allen's

Plain titmouse.

The Plain titmouse next came, but remained, scolding, 20 feet and more away. Next a flock of bush-tits, at least 8, probably a dozen, came and perched 5 to 10 feet from him. They watched and foraged at the same time. All intruders began to fade away. First the wren; then the wren-tits, then the hummers. When I left, the bush-tits were still there (at 9:35). Rhody remained without having moved his feet a fraction of an inch. (End of observation).

Bush-tits.

Order of retiring.

It is interesting to note that Rhody's audience was made up entirely of the smallest birds here at the time. (Temp. 71).

At 10:05 Rhody, who had taken meat from the cage in the meantime, was resting in the shade under a rhododendron, but shortly left for a good, long drink at the glade.

At 11:20, when, after returning from an errand, I approached the cage, Rhody spotted me; and when I turned toward the shop, trotted along behind me to get the mouse that he knew would be forthcoming. This creature he took from my fingers, squeezed once and quickly gobbled, the feathers on his neck rising and falling spasmodically for several seconds as the mouse struggled violently after reaching its destination.

Rhody bore this internal activity with philosophic calm--apparently not incommoded in the least--then mounted to the window sill of the tool-house where he looked at his own reflection with mild interest and without display of any kind. When I left a few minutes later he was sitting on top of the wall looking offf to the north, undecided as to whether he should be alarmed or not at the three children playing on an earth embankment 50 yards away.

The new home there is now occupied and contains and attracts children. As it is not far from the cage and from Rhody's loafing territory, a new hazard has arisen in what was formerly his protected rear, practically doubling the alarms to which he has been subjected--perhaps even more than that. This has been disquieting to him, but as yet, it has not caused him to run away in panic except on the few occasions when the intervening fence has been too closely and noisily approached.

These notes show,that,since the dying out of the reproductive cycle, Rhody's treatment of living prey has radically changed. He no longer carries his victims about for hours as offerings to prospective mates,(thus incidentally giving them plenty of time to die comfortably and be swallowed quietly!) but regards them from a purely selfish view-point, hence disposes of them with dispatch, not caring whether they are completely dead or not.

At 12:50 P.M. Rhody was in his favorite acacia with bill open and panting. (Temp. 78). This "panting" is a throat action entirely, it would seem, since it is accomplished by rapid expansion and contraction of an inch or two of his throat just below his "gills". The lungs do not seem to be concerned in it at all as inspiration and expiration continue at normal rate. It is as if an entirely independent mass of air were drawn down only part way and then expelled, suggesting that there is some evaporative surface--short of the lungs--that is brought into independent action as a cooling mechanism. This action is analogous to the superposition of of harmonics of higher frequency upon the fundamental low frequency waves in sound and alternating current electricity.

It is curious to see a bird like the road-runner with its reputation for preferring hot, desert localities, showing mild distress under such moderate temperature conditions; yet it all goes to show that when it has once adapted itself to a certain environment in which temperature extremes are not great, its tolerance of wider range is probably lessened. It is by no means improbable that, if Rhody were used to daily maxima of 110 to 120 degrees, he would find 78 chilly.

5:30 P.M. Drs. Ritter and Grinnell and Mr. Behle arrived at about 4 P.M. to see the birds. Rhody was present until 3:30 but then was unfindable. Brownie, although he had been sitting on my hand taking worms at 3:30, and was located by me after my visitors arrived, would not put in an appearance before them. Also the gopher snake refused to catch and swallow a mouse. We were, in fact, drawing a blank and had to fall back upon inspection of nest

5-36 from the top of a ladder. This was to be followed by a view of the last reel of film of Rhody and his youngsters, since we could not see him in the flesh. However, as we turned toward the house, the old rascal appeared in the road near the oval lawn 100 feet away while a red-tailed hawk circled overhead, attracting his vigilant attention. I went up to him and tossed him worms to get him in the right mood, then got a mouse, joined the visitors, and called Rhody--still 100 feet away. My guests stepped out of R's view behind a hedge, and R came slowly towards us, though he was aware of the presence of strangers--also of the hawk. When the mouse was placed upon the ground in plain sight of all of "us" R grabbed it, retreated about 15 yards along the road and gobbled it neatly. He had redeemed the situation, and earned my gratitude by living up to specifications under conditions that were trying for him.

After this he dusted. This is usually a final act before going to his roost; but on this occasion, as soon as the visitors left about 5:15 and I went to sit by the oval lawn, he marched up to me and stood facing me expectantly. I tossed him a couple of worms, which he caught. A third struck him on the tip of the bill, but he did not open up for it, and continued to look at me. I do not know what he wanted--if it was another mouse he was foredoomed to disappointment. In a few moments he began cutting foolish capers about the lawn and the surrounding shrubbery and striking exaggerated poses before individual birds there. Perhaps this was intended as a protest at my lack of generosity. On the other hand the mouse--a good fat one--may have filled him with pep and he was just showing off, or expressing gratitude!

While he was approaching to get the mouse, back-lighted by the western sun, impalpable cloudlets of dust floated off from him, again demonstrating the dust-saturated condition which these birds maintain.

August 13th.

Rhody remained unseen here a large part of the day, but about 4:30 P.M. headed for the cage for meat and magpie inspection.

When he came out it was evident that he intended to see what prospects I had to offer, but, on catching sight of my nephew (E.D.) sitting by me, hesitated to approach. I then rose and took a few steps toward the shop. This he understood perfectly and started to follow his usual route which involved passing by the stranger. After hesitating to consider this hazard, he took a detour which placed trees between him and the suspicious object and headed directly for the shop yard, arriving there well ahead of me, and was there patiently awaiting my coming to perform the customary mouse presentation when I arrived.

Thus, once again, Rhody has demonstrated his ability to omit an important element in an acquired pattern and proceed directly by a short-cut (topographically as well as mentally) to a desired end. The standard pattern has been for him to follow me to the mouse abode. On this occasion an unforseen event--the presence of my nephew blocking the usual route (a physical as well as a mental hazard) caused him to alter this pattern, omit the following part, and go directly, without guidance, to the place where experience has taught him that he can get a mouse provided I am there, and there await my arrival.

This involves learning, memory, adaptability to new and unforseen conditions, ability to change a habit , elimination of non-essentials, purposefulness, concentration upon an objective in the face of distraction and, or, some mental (or psychic)

process beyond the mere automatism of ancestral inheritance. In other words, in every-day language: this was an act of intelligence.

August 14th. (This record made at 11 A.M., temp. outside in shade: 68 deg. C/c for Dr. Grinnell, since the observations answer some questions that arose on his last visit and some that did not).

Rhody rests.

About 9 A.M. Rhody was seen to climb to his present favorite day-time resting place in the acacia, 6 feet from the ground. I went there and talked to him, and, as happens often, he closed his eyes and dozed--a perfect picture of physical comfort and well-being. He had already eaten one of the three pieces of Hamburger in the cage. During the hour and a half that he remained there--the last half hour or so preening (feathers from his back and breast being removed in the process) I visited him frequently and, between visits set up the motion picture camera under the pine where I keep the gopher snake and got the little yellow-bellied racer in his bottle ready to put in front of the camera when Rhody should turn his attention to more mundane affairs.

Testing R's sense of ownership in nest 5-36.

Meanwhile I climbed the ladder to nest 5-36 to see if Rhody would exhibit any remaining sense of proprietorship in the nest by going up and sitting in it while I was there, as he did on the only previous occasion that I had visited the nest thus, but during the nest-building period. He showed no reaction whatever, but remained quietly in his perch 30 feet away.

I now discovered that the gopher snake had his nose dipped into his water dish and that his "gills" were moving rhythmically--expanding and contracting--and his neck was making swallowing movements.

Proof that gopher snake drinks.

The top of this dish is covered by a half-inch mesh wire netting. This cover is "bumped" down into the water intentionally. Where the fabric enters the water a capillary meniscus is formed. Any change in the level of the water of the order of a thousandth of an inch can be easily detected qualitatively, without instruments, by watching these capillary films. They were stretching. The water was lowering. The snake was drinking and apparently with closed mouth--but when his mouth is "closed" there is still a little depression at the tip of his lower jaw (possibly also the upper as well) through which he can and does thrust his tongue; however, he was not lapping up the water ; he kept his tongue inside his mouth. He drank for several minutes.

Ownership test repeated.

Rhody was now down from his perch, preening on the ground 25 feet from the base of the ladder. The ownership test was repeated as before, but under more favorable conditions due to R's having a better view and being in a more active state of mind. The result was negative as before.

R again demonstrates ability to omit non-essential ~~essential~~ element of an acquired pattern.

Rhody was now thought to be in a receptive mood in respect to the contemplated snake trial. This was tested by my leading off to the scene of operations 100 feet away, following the route which Rhody knows leads to the shop-yard and a mouse, and which would cause him to pass by the camera while I got the racer in advance of his arrival. This worked beautifully, but Rhody, impatient for the mouse, went right on past me and headed for the yard knowing (or, rather expecting) that, as happened yesterday, I would follow and perform my share of the implied bargain. However, I halted him by exhibiting the snake, and he came back.

Intelligence?

(Here, again, Rhody showed that it is not necessary for him to follow slavishly an acquired pattern. He can leave out portions that his own experience has demonstrated to him to be non-essential in bringing about a desired result. This behavior was not accidental. This is the third time it has been recorded in these notes. He has put two and two together; has associated cause and effect; has planned).

R and racer.

The motion picture resulting should show him inspecting the bottle and its contents; the snake (about 12" long) striking at him but only hitting the inside of the bottle; and R's reactions.

Puts it out of commission, but will not eat it.

Following this, the snake was taken out of the bottle. Rhody, whose interest had been declining and whose mind, as subsequent events suggest, was still occupied by the mouse fixation, returned (camera put in action) grabbed the reptile back of the head and put it out of action immediately--much to my surprise. It was not even able to crawl, though it later recovered. Again to my surprise, R did not want the snake at all and edged away, but when I started toward the shop, followed with enthusiasm, and gobbled, without ceremony, the white mouse offered. This preference for the mouse on this occasion supports earlier observations indicating that the road-runner likes variety in its animal diet.

But prefers mice.

Sign that he wants variety.

The other side of the picture: his getting fed up on mice, has been observed before, but this is the first time he has been known to pass up a snake for a mouse.

Ownership test again shows negatively.

At 1 P.M. R had nothing on his mind, so watched me climb the ladder to nest 5-36. This time his answer was to turn his back, pick out a nice hot spot and spread himself out flat in a spread-eagle "sun-fit", despite the fact that I shook the tree and pretended to tear his nest to pieces.

1:40 P.M. Evidently this is to be a restful day for Rhody, for he is now back in his day-roost again taking it easy. Perhaps preparing space for more mice. (C/C ended here).

As I left at 2;10 R was "as he was".

Returning at 4:30, R was seen preening on top of the cage. When I seated myself nearby he soon, without invitation, came down and to me, purposefully and without hesitation, planting himself firmly, facing me 5 feet away, and confidentally awaited development of the foreseen consequences. (Worm catching of course). This completed, I left him there and went to the shop; he followed by another route, but the result was the same: a mouse from the newly acquired supply. Again he was too hasty, and the mouse after having disappeared--all but its tail--was hastily disgorged--and started to run away! This was the sloppiest performance yet seen, and R had to "kill" it "again". I wonder if there is any risk of his being bitten internally.

R swallows live mouse too soon.

August 15th.

Progress of Moult

(A) **Brownie.**

This bird is now looking better, though still very shabby, with bluish under-down showing through in places and slaty pin-feathers on forehead and neck. There are two gaps, symmetrically disposed each side of the axis of his tail where rectrices are missing. (While in the middle of this sentence, 9:15 A.M., a thrush (Russet-backed?) appeared outside the window. It is also

(Thrush)

~~ks~~ moulting and looks as shabby as Brownie. It has been here three days). As noted on previous occasions, Brownie is now lighter and greyer.

He sings long quarter songs and occasional full-song; the latter mostly in the mornings.

(B) Rhody.

This animal, like Brownie, has been moulting for months, but oddly enough, he never looks very shabby. At present the conspicuous under-tail pattern consists of 4 large spots instead of 6. The two missing ones can be seen when he works on his tail and spreads it. They are at the tips of the concealed, new rectrices sprouting from under his upper tail coverts.

He continues to work on his plumage incessantly when there is nothing more important afoot.

(Written8 P.M.). Rhody hung around all day, from about 9 A.M. In the morning he preferred meat from the cage and wanted no mice; nor the small yellow-bellied racer, either, although he was willing to pick it up by the head and drop it, then walk off to his perch in the acacia.

When Brownie came to me for worms, about 10 A.M., he was very shy about making the last leap to my hand. The cause proved to be Rhody staring at him from behind me, where he had slipped up quietly. R merely wanted to look, then wandered off for a long drink.

At 4:30 Rhody followed me enthusiastically to the shop yard for a mouse.

At 5:15 he was again willing to consider mice, but as it proved, only as a curiosity, allowing the mouse to stroll off into the bushes. It occured to me that he really did want something to eat, but that the mouse was too large (a white one). Accordingly I returned to the shop-yard, and rather to my surprise, Rhody followed unhesitatingly and waited expectantly. This time I selected a very small, young rat, perfectly naked. This was what R wanted and he gobbled it still squealing. When well fed and food is abundant, he undoubtedly uses discrimination in selection, and appears to have some judgement as to the size of the creature that will best fit into the vacant space left in his interior.

August 16th.

At about 8:45 A.M. I looked for Rhody, not seeing him in any of his accustomed haunts. But there was a stir in the bushes and he trotted toward me with moderate display of wings and tail. At the moment I do not recall his having done this before.

Julio had put a freshly caught (and dead) house-mouse in Rhody's food dish in the cage. I got it, R watching through the wires from outside and whining with lowered head. I twirled it by the tail to give it the semblance of life and he gulped it after briefly "killing" it.

About 9:10 A.M. he retired to the top of the cage to preen, working at the point of attachment of each feather and removing the sheath At 11 A.M. he was still engaged in this operation at the same place, and while I was absent perhaps half of the time, it is probable that there was no cessation in that activity. For the next 45 minutes the same work continued: nibbling at the base of each feather treated for 1 to 4 seconds, draw-

ing it completely through his bill, a deciduous sheath usually floating off. No oil was used, and no feathers were removed during this period. All parts of the body accessible to his bill were treated. He did not use his feet.

At 11:45 he decided to come down and renew contacts with affairs on a lower plane. First a casual glance at himself in the mirror without display; next looking and listening at the place in the cage where the lizards ought to have been; next laying his chin flat upon the flag-stone in front of the mirror to determine whether it would make a satisfactory rest while he sun-fitted. For some reason it did not work out right, so he moved a few feet away, found the right place, settled down, pushed a clod or two out from under himself by sidewise thrusts of feet and composed himself in spread-eagle fashion. This use of the feet in pushing material aside to make a satisfactory couch is the nearest approach to scratching in the earth seen on the part of any road-runner at this place. It is a typical act of this bird. In performing it the feet are never moved from front to rear as in the scratching of the usual run of birds, but at right angles to the body. There is no pulling--it is all pushing. Usually the bird is already lying down and the feet can be seen only at the end of the thrust.

If we consider the arrangement of the bird's toes: two pointing forward and two pointing rearward, it is obvious that his feet will be better scrapers if pushed sidewise than if moved in a fore and aft plane. Perhaps this is the reason back of this odd performance.

A few minutes of sunning and Rhody decided to join me in the shade, lying beneath a rhododendron, also in the shade of an oak. The rhododendron (often also called "Rhody") and the road-runner "just naturally" don't belong in the same environment, but at this place, through the agency of man, they seem reasonably contented in each others company.

When I moved off at lunch time Rhody promptly followed , confident that my course would intersect the mouse-rat zone and that the wants of a hungry road-runner would be satisfied forthwith. And that, of course, is the way it worked out.

Now man, who has arrogated unto himself primacy in the animal kingdom, and who has made all the definitions, prides himself upon the intellectual feat which he has accomplished in fitting a few of his fellow creatures into what he calls a "pattern" from which they have not mind enough to depart. This achievement he has trumpeted to the world through means of communication developed by himself and which have now taken charge of him and become essential to his very existence. Yet here we have one of these lowly creatures whom we patronize, who has, without self advertizing, without artificial aids or knowledge of the work of others, while still maintaining his physical and intellectual freedom, within the space of a few months of modest "research" , successfully, with no margin of error whatever, completely worked out the pattern (insofar as it interests and concerns him) of one of these superior creatures. This superior creature, to wit: myself, is so incapable of deviation from this pattern, that Rhody with absolute confidence, bases his actions upon that knowledge, and it works, not once, but every time! And to his advantage. Surely what brain he has gets results!

About 4:30 P.M. two of us (G.K.D.) were sitting near the cage watching Rhody inside. He was mildly concerned about the presence of the visitor and hesitated about coming out. I was called to

the 'phone and followed the route which Rhody has identified as a part of my pattern linked with the mouse association. I returned in a couple of minutes, but no Rhody. (G.K.D. had also gone to the house). The question was; Had Rhody acted upon his knowledge of my pattern and gone to the place where I keep the mice?

The "Mousoleum"

(Dr. Grinnell, by the way, has happily called this my "mousoleum").

He had, and was waiting there, motionless, for the completion of the pattern, in faith and prescience. It was a narrow squeak! I had no thought on leaving that I was following out the first portion of Rhody's discovered pattern of me. In supposing that I was, he was, as it proved, right after all, for he got his mouse. (The third for the day).

August 17th.

R refuses mice during forenoon.

Rhody, after his mouse debauch of yesterday, deferred visiting the cage until mid-afternoon. He wanted no mice at all, preferring Hamburger. Too much mouse-hair lodged in his gizzard, or merely following his customary plan of varying his diet?

His moult.

He is still not finished with his moulting, which began (or was first observed) about April 7th. (See note of Apr. 15th.) He has been moulting for four months.

over

August 18th.

R eats no mice (again) during forenoon

Rhody continued to omit mice from the menu, preferring to eat meat and catch lizards, until late in the afternoon, when he changed his mind and followed me to the shop yard. There he ate two young, pink, hairless rats, without ceremony other than to look at himself in the tool-house window for a moment or two after each meal. He was careless about killing the rats, both kicking after they reached bottom, and one of them could be heard to squeal at least once when all the way down! This internal protest brought no responsive action from the bird at all. It may be that he enjoys music with his meals.

Rat heard to squeal inside Rhody!

August 19th.

Again R wants no mice in A.M.

Rhody again "lay off" of mice during the forenoon, but at about 2:30 P.M., followed to the shop-yard, gobbled two young rats in qick succession, hung around as if for more, but refused to be tempted by a mouse.

Rhody tries on me tactics hitherto reserved for other occasions (??).

Then followed a long preening session on top of the cage. At about 4:20 he came down to observe possibilities, stood in front of me and caught tossed worms.

Here he introduced a new stunt, according to my recollections. These notes have referred to his habit of "shrugging his shoulders", really a short, quick partial opening and closing of his wings, when standing over a mouse or a lizard. Although at times it looks very much like an expression of disgust or impatience when things do not exactly suit him, or, at other times, and in other circumstances an expression of interest. With mice and lizards and other living creatures it may be intended to frighten them into action, for, unless extremely hungry, he wants these creatures to dash off at full speed so that he can catch them, put them down again and start all over.

In the present instance, 2 or 3 times, he flirted his wings while standing stock still waiting for the next worms. The impression given was that he was tring his "hurry up" tactics on me. There was no worm in front of him.

Rhody uses great care in killing a mouse, after recent carelessness.

After this he followed rapidly to the shop for a mouse. A rather large one was given him. It was observed that he handled it with great care and, repeatedly, without dropping it or slapping it upon the ground, crushed its neck between his powerful mandibles. Usually a squeeze or two is all he gives. Perhaps he has some sort of realization of his recent careless disposition of mice and rats. Possibly he is tired of having them kick around inside and does not like internal orchestration after all.

August 20th.

Mice again have preference over meat.

Rhody's liking for mice has now completely returned, so that today he ate no meat at all and had his first mouse in the morning. Within three hours he was ready for another one. This time, when he followed to the shop, I had a little surprise for him-- a live sparrow. He looked at it doubtfully and seemed somewhat timid.

R and sparrow.

He would not take it, so I tossed it to him. The bird managed to get its wings in action just as it arrived an inch or two from Rhody's bill. This startled the road-runner so that he crouched and allowed the sparrow to continue onward over his head, but kept his place, waiting for me to get back into my "pattern" after this unexpected divergence from it.

Mouse makes big disturbance inside Rhody.

In this his judgement was sound, for naturally the next move was to justify his confidence. This mouse was apparently very thoroughly killed, but it raised the biggest disturbance inside yet seen. The bird made no attempt to disgorge it and bore the struggle stoically even when the kicking mouse began to ascend and appeared as a lump on the side of his neck just below his ear coverts. One swallow more and there was no lump.

August 21st.

Today Rhody ate both meat and mice, but mice were predominant in his diet.

R and weather.

It was dull all day, and this seemed to be reflected in his behavior, as he appeared sluggish and disinclined to move about.

August 22nd.

Brownie--no convention as yet?

Brownie continues his habit of singing mostly during the early morning hours, thereafter remaining silent, or nearly so, the rest of the day. Unless the "Convention" has already been held so far away that no sound has reached here, there has been none.

B's moult.

He is still shabby, though much improved in appearance.

Relaxation of territoriality.

Thrasher of second brood returns?

As a possible precursor of this phenomenon as observed in previous years--this afternoon when I was endeavoring to call Brownie to the oval lawn (he was away some place) another thrasher, probably only by chance, came to the feeding station. This bird was sleek and trim. I talked to it and tossed worms. Soon it was crossing the oval lawn to pick them up 6 or 8 feet from me. It was noticed that it had a slight "mane" and I am inclined to think that it was one of the 2nd brood of this year. Certainly it was not very wild.

Rhody returns to form.

Rhody returned to form, his sluggishiness having departed; perhaps because of return of sunshine.

Eats mice and meat.

He had both mice and meat today.

August 23rd.

At 8:30 A.M. Rhody was out in the field to the south, catch-

ing grasshoppers, as I proved by going out there and watching the performance. When he does this his "expression" is bright and interested. He pretended to ignore me, but his movements worked him closer to me just the same, and when he reached me he lost interest in grasshoppers; though even then he affected to regard my presence as unimportant. Nevertheless he was quick to catch the first worm tossed.

Later he came home to get meat in the cage and a mouse at the shop.

Still later I unintentionally gave him a scare by suddenly appearing at the gate of the shop yard as he was about to enter directly at my feet. This yard is entirely surrounded by wall and he can not see what is inside until he reaches the gate. When I nearly stepped on him he darted off like a flash, but stopped abruptly not more than 6 feet away, then followed me in promptly, with no sign of fear, confident that I would follow my accustomed pattern--which, of course, I did. See how quickly the bird, through his acquired knowledge of my habits and instant recognition of me overcame his instinctive fear and flight. He was not coming straight through the gate, but turning the corner as he walked parallel to the wall. Therefore he did not see me until I was upon him. His speed of departure was certainly no less than that of a man running a hundred yards in 10 seconds (about 20 miles per hour). In all probability it was twice that; but taking the lower figure, the elapsed time between his first seeing me and his abrupt halt was of the order of one fifth of a second. In that short period of time he perceived a fancied danger, became frightend, fled ~~towards~~, recognized the dangerous object as a friend, overcame his instinctive fear through acquired knowledge of the friend's characteristics and acted upon that knowledge.

Incidentally it will be noted also that my alarming departure from pattern did not destroy his confidence that the rest of the pattern would be followed out normally. (This pattern business works both ways!)

August 24th.

At about 8 A.M. I looked for Rhody in his accustomed haunts, including the field to the south, without success; but when, after deciding that he was not to be found, I happened to glance at the saw-bench (pp. 1233-A and B) there he was, placidly observing me, indifferent to my wanderings. However, when I entered the cage 30 feet away, he dropped to the ground and unleashed a series of serio-comic dashes and retreats in and around the shrubbery, with spread tail and wings and peekaboo effects for the benefit of imaginary kindred spirits, then came to the wire separating us and waited as if expectant of well merited applause; though what he wanted was, of course, worms. But why all the monkey-business? It's a mystery to me.

Rhody, though friendly and "tame", as the notes show, remains essentially a wild creature, always alert when there are fellow creatures moving about in his immediate vicinity and never completely off guard, even with me. Scores of times I have observed that he comes to me more confidently when there is a barrier, such as a wire fence or the wire netting of the cage, between us.

Thus, on this occasion, when I approached the wire from inside he came promptly to meet me and sat close to the wire, reaching through the mesh for each of the 20 or 30 worms offered one at a time, taking each gently from my fingers. Yet one awkward and too quick a movement on my part caused him to jump back hastily.

It was only about 2 feet and he returned instantly, but the instinct of self preservation was not asleep. He had to have time to satisfy himself that the movement was not hostile.

This nervousness does not necessarily imply fear of me as a man. He will do the same thing with anything that moves suddenly or unexpectedly: any insect, bird or animal or even inanimate object in sudden motion, brings about this reaction. Even his own offspring. His recovery is usually a matter of seconds or even fractions, but his senses must assure him that no overt act is impending.

He has learned from personal experience that he can not get through the wire fence or the wire netting of the cage. It would seem that there has been a certain amount of something closely akin to reasoning on his part by which he has established to his own satisfaction that an obstacle which is an impenetrable barrier to him is equally effective in keeping other animals from getting at him. The wire works both ways. (He has not learned that man has tools that enable him to disprove the correctness of the road-runner's "deductions!").

Rhody's behavior indicates that he knows (or thinks he knows) that I can not go through the wire. How does he know? He has never seen me try it. Assuredly the impenetrability of wire fences to man is no part of the racial inheritance of road-runners.

(As a matter of fact his "deductions" as to the cage are wrong; because I can get through the wire fabric easily with or without tools!)

Rhody next discovered a small brown moth on a twig. He advanced on it cautiously, now and then "shrugging " his wings. He made no final rush, but picked it off as casually as one would a tomato. This did not satisfy his dramatic and sporting instincts(? so he carried it to an open space and there released it deliberately. It fluttered along the ground and he followed. When it stopped fluttering he picked it up and started it off again. This was repeated several times. When the procession reached my feet and the moth stopped, Rhody gobbled it without further ado. (This looks like play--but I believe animals are not supposed to play--man's definitions do not permit it! It would trespass upon his self-allocated domain. But it will be all right if we coin a new word for it which means exactly the same thing, but we must not admit it. Unfortunately I do not know this word, so can not insert it here).

Rhody next sought his favored day-roost, still in that acacia. At 11 A.M. he was still there.

Sometime about noon two women and a little child chose a spot about 20 feet away from this tree, on the other side of the fence, in which to spread a rug and make themselves comfortable for the rest of the afternoon. As a consequence Rhody avoided the vicinity of the tree altogether. There is nothing that alarms him more than the sounds made by a young child. Next to that: the voices of women, i.e. certain kinds of voices of women.

Perhaps due to this disturbing element, he made a formal call upon me, coming in at the front door like a gentleman, spending most of his time looking out of the windows. He included this room and the stairs in his inspection tour. While he was still in the front hall a visitor (D.D.C.) seeing Rhody through the open front door, remained standing there so as not to alarm

the bird by approaching nearer, and called to me in the living room. I found Rhody not alarmed at all, quiet and composed. Soon he climbed the stairs to the landing and gazed for a long time out of the window there. Ascending further, he found all the doors closed, so turned back. This was quite a test of his courage, since two of us were watching him and he was really cornered--a situation intolerable to all road-runners of my acquaintance, and one which inclines them to panic. However, all of his movements remained slow and deliberate; he instantly caught a worm tossed to him, permitted me to take close-ups of him with a still camera, then came down to where I had opened a window for him. He finally departed by that route, still showing no signs of fear.

August 25th.

The same group of persons, with one more youngster added, again occupied the shady place near~~s~~ Rhody's roost, once more forcing him to seek repose elswhere. This time, after satisfying himself that they were really there by stretching to his full height and listening intently, he sought refuge in the old oak, where he remained for about 2 hours, preening and resting.

At about 4 P.M. he followed to the shop-yard for his mouse. He still is in the mouse-meat phase of his food cycle.

Feathers still occasionally float off from him when he preens.

The pattern of his tail is not yet fully restored.

August 26th.

Much full song by Brownie, first heard before 6 A.M. and lasting until about 7:30.

An hour or so later the young thrasher was at the oval lawn; Brownie came and caused him to move on a couple of yards, but did not object to his presence there in the bushes.

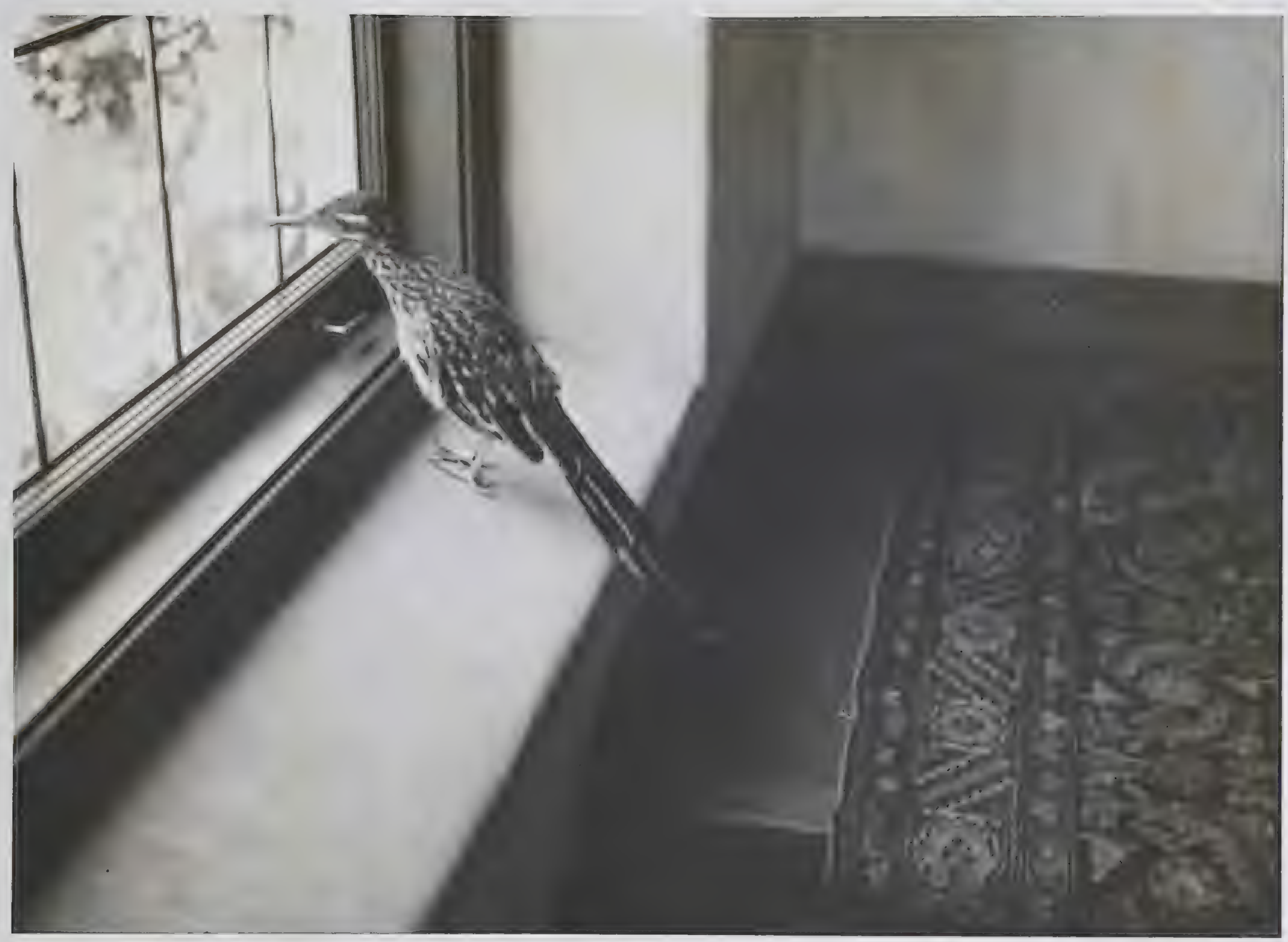
Rhody found me about 9:30 as he wanted a mouse. After that he retired to his acacia, the picnicers not having put in an appearance.

2 P.M. Rhody, just now, came down from the acacia, where he had spent several hours. The picnicers had not yet arrived, but he inspected their chosen spot from long range, then trotted after me to the shop-yard. A young rat failed to interest him. A butterfly was offered with the same results. Next a very lively Jerusalem cricket interested him merely as a spectacle. A live mouse was then produced without causing him to budge from his tracks. He became bored with my exhibit of local live-stock when it appeared to him that my recourses were exhausted, but waited a minute or two, out of politeness perhaps, then strolled off.

When I went to him and tossed him worms he was willing to catch them, but, I suppose, he was not really hungry. Assuming such to be the case, why did he follow to the shop?

At 5:30 P.M. Rhody was at the junction of the upper and lower roads near the tool house. I got theimpression that he was waiting for me to initiate a mouse expedition. As I approached him he displayed slightly, allowed me to pass, then followed to the shop-yard where there was no hesitation in accepting the first offering --a white mouse.

This is now the third(?) time I have found him waiting there at about this time and when I have not been in touch with him for several hours, and when sufficient time has probably elapsed since the preceding mouse to arouse his taste for more.



Rhody, August 24th., 1936, comes in the front door like a gentleman on a formal call, wanders about looking out of the windows in the hallway, then goes up to the stair landing where he considers the outside world from that point of vantage. See pp. 1248 and 1249.

It will be seen that about 4½ hours after he ate the first mouse he was sufficiently interested (?) in mice to follow to the shop, although he did not eat one. He was clearly not hungry. Maybe my "pattern" is becoming so merged with his that he has some impulse to follow it out whether hungry or not.

August 27th.

Rhody, I think, spent the whole forenoon on the west lot. He was there at about 8 A.M. and got worms from me. Three times more during the forenoon I looked for him there, each time finding him. He would not leave it, although once he came part way down the bank to get a grasshopper that I tossed there.

About 1 P.M. I found him in the cage studying the magpies. He followed rapidly to the shop-yard for a mouse. A white one offered first, he simply stared at. A light grey one was taken at once, kicking about 15 seconds after it was downed.

There being no disturbing picnicers, he resorted to his acacia At 3:15 he was still there. Ditto 4 P.M.

I went out a little after 5 P.M. He was now studying the magpies, but came out and followed to the shop-yard. (4 hours after eating the mouse--compare with yesterday). A white mouse offered was, again, merely something to gaze at with no particular interest. A light grey one was no more attractive even when it crawled near his feet. He merely shifted his feet a little and watched me. These mice were both pretty large--except for a very hungry bird. I thought they were the smallest I had, but discovered a new litter in which the young were about the size of a man's last little-finger joint. Rhody was instantly interested, reaching for it at once and swallowing it. He then moved off, but, to my surprise was back again in a minute or two patiently waiting. I gave him another of the small ones, which was eagerly accepted. This was enough. (I neglected to state that he had eaten meat in the cage before following me).

His refusal of the two large mice seems to indicate that he has some optical measure of his stomach's requirements: that he knows what he needs and sticks to it. These two mice were not too large for him to swallow if he wanted them. He wanted something smaller. He was in error when he departed after eating the first tiny one, but he rectified it by coming back for a second one.

(I also neglected to record in proper order that he indulged in his fancy antics when he came out of the cage, with boos and bill-snappings. Aside from the magpies, I was the only spectator. I wonder if this performance isn't really a case of exhibitionism. When he finished it he came and stood behind my chair quietly, but followed at once when I left for the shop. Perhaps it is an expression of pleasure in anticipation of a desired event).

August 28th. to 31st., incl. (Note written Sept. 1st.)

Brownie. Song, convention, moult.

During this period Brownie sang much during the early morning hours and sometimes for most of the forenoon, both here and elsewhere. Several times I heard him as early as 5 Or 5:30 A.M. when I happened to be awake.

His moult is still unfinished, principally as to tail-feathers. He is now much lighter in tone and almost the color of the mourning dove.

On the 31st., whne I could no longer hear his song at all, I suspected that he was off to the east several hundred yards away. As a test I whistled his purple-one-two three call while standing in the driveway near the old oak. In less than a minute he

answered from the expected direction about 250 yards away and soon was seen sailing down hill toward me in the longest single flight I have ever seen him make; practically all of it a glide, landing about 40 feet in front of me and running the rest of the way.

Rhody continued to eat both mice and meat, not hesitating, if hungry enough, to eat mice of any color or size. On the 30th, I was away from 5:25 A.M. until noon, on my return finding Rhody in his acacia. He greeted me with whines and followed to the shop for his mouse.

His fear of strangers remains undiminished. On one of these days two boys came to see the birds. Rhody was found in the cage. He retreated to the highest and most remote point from us as we approached and peered out from behind a shelf while we were still 50 feet away. Finally he decided to come out and while still in the cage, conducted himself with great restraint and dignity; but as soon as he reached the door, he was off like an arrow and could not be found as long as the visitors were present. Within five minutes of their departure, he was in full sight in the middle of the driveway, waiting for an invitation to follow for a mouse.

Sept. 1st.

Now that Rhody, presumably, is no longer distracted by the mysterious impulses of the reproductive cycle, his actions are less complex and his mental activities, as judged by his behavior, are better coordinated. He still likes to visit the magpies, watch them closely and occasionally rattle his beak and boo at them, with a little display now and then. There is no longer any ceremony attached to the acceptance of mice: no bowing, hrooing, tail-wagging and presentation at the mirror. A glance now and then at the mirror, indifferently for a second or two is as much as can be expected; although after eating a mouse in the shop-yard he is inclined to jump up on the window sill and make a brief survey of his reflection. He has not gone back to his older form of "mirror-dance" at all. There is no more carrying about of mice and lizards with song from high places. In fact he scarcely mounts to the roof at all.

He is never seen at any of his nests and seems unaware of their existence. There is no aimless picking up of things, carrying them a few feet, dropping them and trying something else.

He seems to know pretty well what he wants and how to get it, and be able to carry out a modest enterprise to its logical conclusion without being deflected from it by minor distractions.

Thus, this morning, two examples: About 9:30 A.M., as I passed a bush of Old man, I came suddenly upon Rhody busily engaged in preening in the open six feet away. There was not even a momentary start or instinctive crouch. He kept on preening. (Itself an interesting operation, with deft touches of the bill here and there to fluff out feathers that had become matted; rubbing of his cheeks upon his oil-gland then using his head as swab to apply the oil to his feathers, drawing each of his tail and wing feathers through his beak to the very tip; scratching his crest and removing the "dandruff"; a vigorous scratching of his "gills" first on one side and then the other; delicate probing about each eye ; a final stretch followed by a vigorous shake). While preening he paid no attention to me at all; but when finished, stepped closer and waited, anticipating a mouse invitation.

When I walked toward the shop, he followed of course, with

crest raised and skin colors displayed.

Arriving there, he watched closely while I fished out a mouse. He did not move an inch to get it. I put it "under his nose". He looked at everything else but that, never shifting his feet. I put the mouse back. He waited and watched. I got one of the tiny ones and offered it in the palm of my hand. He immediately advanced and gobbled it, but still waited. That meant: No big mice, but another little one. This eaten, he trotted off at once, contentedly.

In the first example preening was his major concern at the time and he made a thorough job of it, not being deflected from it until it was completed to his satisfaction. Not until then did he undertake to start me off in my "pattern"--consciously or otherwise--by taking the initiative himself.

In the second instance, in conforming to my pattern, he very clearly showed--to my mind--not only that he knew precisely what kind of a mouse he wanted, but that if the first one offered proved unacceptable, a substitute would be offered in all probability, as past experience had shown him.

September 2nd.

From about 11:30 A.M. to 2:30 P.M. Rhody kept close to the house, mostly in upper garden not far from this window. He was given a mouse about noon--a good big one--and instead of going away, hung about where I was having lunch in the cloister. When finished, I tossed him a couple of dozen worms one at a time, which he caught expertly. Still he hung around, at one time marching through the front door into the hall, out again, but still near at hand. I stepped out of the shop where I was working on a remote control for the motion picture camera and found him loitering outside. I did not think he wanted another mouse so soon (2½ hours) but he did and followed me to the "mousoleum" uttering one plaintive whine. This mouse, like the preceding one, was large.

September 3rd.

Rhody absent.

Rhody was not seen here all day and his meat in the cage was untouched. Tired of mice?

B's soft talk.

When Brownie came to me for worms he was quite talkative in a gurgling, querulous sort of way. I had previously noted the presence of another thrasher about 20 yards away in the bushes and as B kept looking in that direction, no doubt the talk was intended for that bird, yet it was so low that I am sure I could not have heard it more than about half that distance.

September 4th.

Brownie again repeated the above behavior, again with a strange thrasher having just been seen a short time before.

I looked for Rhody in his usual haunts several times during the forenoon without success, but at noon, as I passed the cage, he dropped down from a perch inside and came out to see what I was going to do about things in general. Accordingly I turned toward the shop yard, but without suggesting that he follow. He lost no time in keeping me company, even running abreast of me as I approached the gate. Here I stopped to see if he would take

the lead and precede me to the mouse abode. This he did without hesitation, arriving first by about 15 feet, and stood quietly by the table patiently waiting. I purposely took my time about getting a mouse for him in order to see what he would do. He looked up at me as if to divine my intentions.

He was given a large white mouse. It was so large that its tail stuck out from his bill for a few seconds like a cigar. While at this stage of its consumption Rhody jumped up to the low window sill for his, now usual, glance at himself in the glass.

At 3 P.M. Rhody, who had been spending most of the time in his acacia and on the ground near the cage waiting for worms to be tossed to him, began edging off toward the shop-yard. When I followed he halted, then kept pace with me. At the gate we both stopped, but Rhody, this time, waited for me to go first. He accepted instantly the first mouse offered: a large white one. This downed, he jumped to the sill for a swift glance at his reflection.

At the present time Rhody has no special interest in the opposite sex--it is too late in the season. Nor, presumably, like Brownie, is there any particular reason why he sholuld defend territory at this season. As a consequence there is no incentive for him to indulge in his mirror dance in so far as it represents the arousing of combative instincts in the presence of a stranger, nor his presentation of prey and nesting material at the mirror as a part of his reproductive cycle. Therefore he does not seek out the mirror any more.

The tool-house window, however, is only about a foot above the ground and 3 or 4 feet from where he usually stands while disposing of a mouse. It is not a good mirror--the back-ground is not dark enough and the glass is wavy. But, no matter where he stands, he can always see some sort of a reflection in it, though not necessarily of himself, dimly. Any motion whatever on his part causes something to appear to move in the window, hence he investigates this mystery. But, when he has his eyes close to the pane, this moving thing is gone and there is nothing but the dim interior of the tool house and the shrubbery outside the window in the opposite wall. There is no bird to chase away and none to court. His present attention to this window, therefore, is casual and accidental. Similarly, in the case of automobiles, he probably sees ill defined objects moving about on the polished surfaces and these arouse his curiosity.

September 5th.

9:30 A.M. Thrasher song was heard early in the morning and at 8:30 was almost continuous from a point near the west window of the living room. (It is still continuing).

The singer was located about 30 feet from the window in an oak. I could not recognize the song as Brownie's. It was rather high pitched and all but three phrases were unfamiliar. Its general character was staccato and imperative. The singer paid no attention to me, yet, as later shown, it was Brownie. Thrasher voices, apparently in reply, were heard from the west, north-west, north and north-east. Some of them seemed to be exact duplicates of B's efforts, others not. It was perhaps 20 minutes before I realized that some of them were merely echoes of B and confirmed that fact. Since this time last year a dozen or so houses have been built or started in the territory from which the echoes came. Roughly they are a hundred or so yards apart and from 100 to 300 yards from where I stood, placed at varying angles to the points

of the compass and at different elevations. There are, therefore, many more reflecting surfaces in this neighborhood than at this time last year and I believe that, on the present occasion at least, this circumstance confused Brownie and deceived him as to the numbe of other thrashers present, and perhaps incited him to greater effort than would otherwise have been the case.

After about 10 minutes he shifted to a small, stunted pine standing by itself in the open north of the northwest corner of this place and at lower elevation, and continued his song. Soon another thrasher joined him. He left at once and came running to me for worms although I had not called him; this established his identity. The other bird took his exact perch in the pine. Brownie went to the top of the fence and continued his strange song 7 feet from me, back turned toward the other bird--its back turned toward B. This bird also sahg --like Nova--and from its conspicuous superciliary stripe, song and Brownie's phlegmatic attitude toward it, I believe it was Nova. B evidently did not regard it as a competitor. (See 10:15 entry).

B now moved to a tree behind me and continued to sing 15 feet away. Nova (?) also moved to a tree 75 feet west of B and continued to sing a song much inferior to B's. A third thrasher was down in the canyon below her, since it could be heard when neither B nor she were singing. Another was a long way off to the east.

When B was on the pine there was a complex of sound when he alone was singing due to, echoes.

While this ~~mx~~ may be the beginning of a "convention" season, the impression at present is that newly discovered echoes probably played an important part in this "concert".

At 10 A.M., no thrasher sounds heard from this point and B eating suet outside. Verified by going out and offering worms.

10:15. Absolutely no thrasher sound near or far. (I should have added in commenting upon identifying Nova, that when B came to me, he "talked" to this other bird just as has been noted herein the last two days--before resuming his song. His song, therefore, appears to have been for the benefit of the other thrashers--real and imaginary).

Later in the day B resumed full song and, on two more occasions, attracted Nova in this way.

The young thrasher referred to on Aug. 22nd. was encountered in the orchard. It started to run, but, on being spoken to, returned and hung about me for worms, until Brownie discovered what was afoot and insisted upon more than his share. B did not chase this bird away, merely "crowded" him away from the tossed worms. B , unexpectedly, went away leaving the youngster with me. This bird still has the immature color of iris, although I believe it is changing.

Rhody continued true to form and is verging toward the meat phase of his meat-mouse cycle. Thus he wanted only one mouse today, but ate plenty meat.

September 6th.

Rhody ate meat (while here) almost exclusively, although

he did follow me once to the shop after having loaded up on meat. Arriving in the yard, he awaited developments. A half-size white mouse did not interest him in the slightest. In fact he backed off when it got too close to him. I tossed him a worm, which he caught, perhaps from force of habit, because he dropped it and continued to look at me. I had one more recourse in the way of variety: a litter of 2 day old mice, but R could not have known it, since he can not see any of the mice. Still he waited, standing about 4 feet away without stirring. I let him wait two or three minutes thus, thn got him one of the tiny mice as he was turning away. This brought him back, but without enthusiasm. He looked at it and then at me as if awaiting instructions. On being urged to eat it, he did, although I think he did not really want it. If such were the case, the question again arises, why did he follow me to the shop?

Brownie sang "everywhere" and "all the time" during the day. Twice it was observed that his song brought Nova to him and once Nova answered readily in her peculiar, high-pitched song, but did not come closer than 75 feet, presumably because of my presence. Brownie solved the impasse by trotting off down the driveway to look her up.

Sept. 7th.

1:30 P.M. since first heard early this morning Brownie has again been everwhere singing constantly. (Temp.90 deg.).

Yesterday and today Rhody's pet acacia, which usually gives him the right proportion of sun and shade, is not cool enough for him, so he sought full shade plus breeze. (If he does not perspire what good does a breeze do him if it is of the same temperature as the surrounding air at all places?).

So far today meat was preferred up till a few minutes ago, when he forsook his cool retreat to follow to the shop for a white mouse. He had already eaten three pieces of Hamburger. Again he took his own route to the shop, preceding me at times, but waiting at the gate until I had entered ahead of him. (A polite bird!)

In mid afternoon two boys carrying circulars came up the driveway. This was too much for Rhody and he bolted.

At 5 P.M., however, although I had been unable to find him after this episode, he was very careful to place himself in a conspicuous position where I could not help seeing him (and he me) if I passed near the shop or the cage. This meant, of course, another mouse. (Those I have now are rather small).

September 8th.

The expected thrasher convention does not yet appear to have taken place, but Brownie continues to sing far and near and other thrashers are being more frequently heard. It is possible that a convention has been held elsewhere, of course.

With all this singing and moving about Brownie still had time this morning to look me up on his own initiative three times and sit on my knee between worms--sometimes on one leg.

On the first occasion he talked in low tones. At first I thought: at last B is talking to me, since there is no other bird present; however, Nova shortly came out of the shrubbery and began active work on the worms in the lawn 10 to 15 feet away only--unusually bold for her. Both N and B ate angle-worms freely,

although they are rather indifferent to them as a rule. They also got numerous thick grubs. This is the season when work on lawns usually begins, I believe. (Not checked).

September 9th.

Rhody spent a long time in the cage during the forenoon and ate five pieces of meat up to 3 P.M., not wanting any mice. At 3 , howver, he came to me without being called and waited for results.and examining the ground to see if I had tossed unseen worms. I watched to see what his solution would be. It was to gather a sheaf of pine-needles, carefully selected, and carry them to the mirror. Here his impulses failed to function beyond that point, although he looked toward his latest nest tree, so he dropped the needles and went into a spread-eagle sun-pose. (If there were no other evidence, this would show that today is cooler than yesterday but warmer than days on which the open-bowl pose is appropriate).

When I moved toward the shop he trotted along too for his first mouse of the day although he had hardly finished wiping his bill after the last of the meat.

After downing the mouse he again had a glance at himself in the window.

Now Rhody knows my "worm pattern" as well as my "mouse- pattern". In approaching me, as he did just now while I was sitting in a chair, he evidently expected worms to be tossed and began looking for them. But I had tossed none and, furthermore, did not follow out the pattern that he is accustomed to at all, for I withheld worms entirely. Consequently he found none but did find pine-needles in their stead. I had failed him. His learning had not encountered such a contingency before, but his instinct told him what to do with the pine neeiles. Finding them touched the trigger that released the(now feeble)nest building instinct and he took the needles to the mirror as he had been doing while building nests, but there the impulse faded out and he was unable (or indisposed) to carry out the action to its logical conclusion: placing the needles in a nest.

Frequent song by Brownie and other thrashers remains the order of the season.

September 10th.

Rhody's food preference swung decidedly toward the mouse side today, he having eaten three mice and only one piece of meat (together, of course, with whatever his foraging provided).

The mice were not fully grown. They were taken at 11 A.M., 2:30 P.M. and 4 P.M.

Much thrasher song during the day and B usually in touch with Nova.

September 11th. to 13th., incl.

During this period thrasher song continued to be heard almost any time during daylight hours, Brownie singing here and abroad.

Rhody showed an increasing tendency to absent himself during the forenoons.

On the 13th., at 7:30 A.M. I looked him up at his night-roost not finding him there, but as I returned to the house, he dropped down from a sycamore in front of the Scamell house and came for

worms, then followed me home, stopping short of the mousery. During the whole day he wanted no mice at all, although the day before he ate three.

I have an idea that he has changed his night-roost, but doubt if it is in the sycamore. It has always been in evergreen trees.

September 14th.

11:20 A.M. This morning, Rhody not having been seen, I decided, about 9 o'clock, to see if I could find out where he has been spending his forenoons. I suspected that he might be found off to the northeast on the west side of Dimond Canyon where, since the weather is now cool, he would get the benefit of the morning sun and be away from the ocean breeze. And there is where I found him about 9 A.M.

Two Hours with Rhody in the "Wild".

A street (Estates Drive) runs along the ridge forming the western side of the canyon. It has a steep bank on the east. As I approached this bank from the west and could just see down its slope, there was a sudden flurry of feathers below me about 30 feet away: blue, white and tawny and a road-runner started to bolt, but when it saw who it was, stopped. Rhody, of course. When I spoke to him he came tamely enough to catch the worms tossed to him, then composed himself to admire the view spread out before him to the east. I came back here to get more worms and meat. On returning to the same spot--no Rhody. After a ten minutes' search elsewhere, he was finally spotted a hundred yards away in the open, only a few yards away from where he was first seen, still looking at the view. I sat down 30 feet from him to await developments. He gradually sauntered toward me. I saw a lizard near me which he had not seen and pointed to it suggesting that he get it. It was a little off to the left of his line of approach.

While I suppose my pointing had nothing to do with it, he nevertheless, altered his course and stopped at the point where the lizard had gone down a hole in the ground. (It is, of course, possible that my gesture in that direction suggested to him that I had tossed a worm there and he was guided by his experience on such occasions). While he sat there the lizard came up two feet in front of him and was seen by him for, I believe, the first time. In any case he reacted at once, advanced intensely interested and watched the hole into which the lizard had again disappeared, crouching ready for instant action. However, his interest died out quickly, to my surprise--perhaps because of my presence offering greater probability of food.

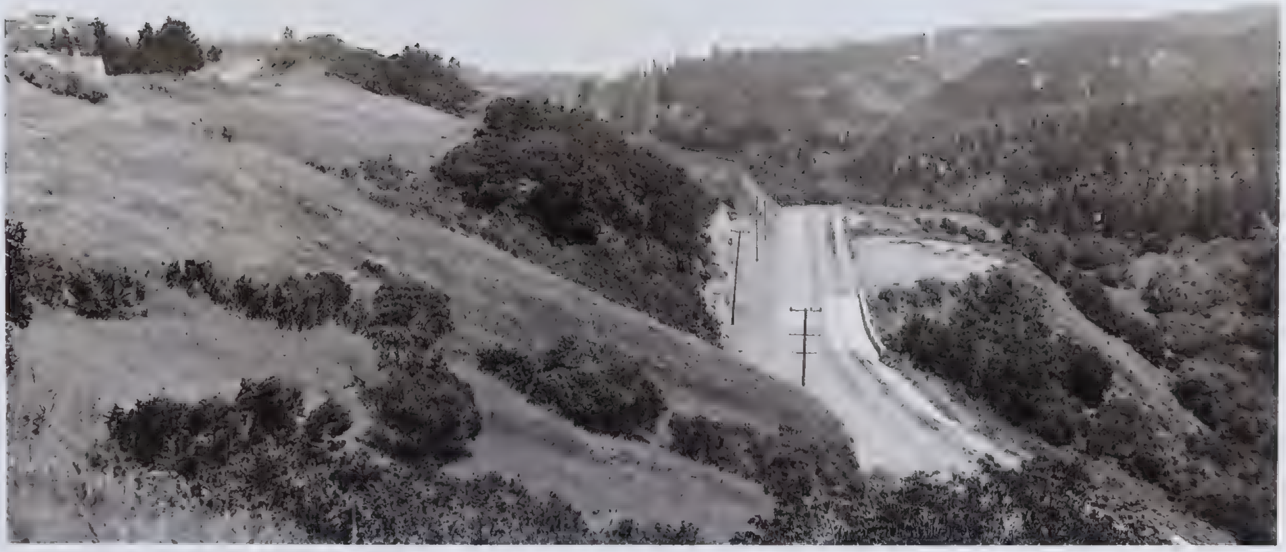
His attention was shifted to me and I gave him a piece of meat. He then settled on the ground near me and continued his watch of events below and to the east: automobiles, men working on the roads, birds flying, aeroplanes, and a cat 100 yards off to the south.

He was comfortable and contented. Life was easy and there was no apparent objective in view. When I left he showed no disposition to follow; although when I looked back, he was no longer lying down in the open, but had moved to the shelter of a bush and was standing on a stone still looking off to the east.

(End of 2 hour period). See p 1256A for view of this

Some time during the afternoon (before 4:30) he came and ate his meat and could not be found thereafter.

A visit to the roost tree failed to locate him there at about 6 P.M.



Looking north along upper slope of the west side of Dimond Canyon, Feb.10th.,1935, when the open field was grass covered. This is where Rhody was at time of Sept.14th. note. Grass now (Sept.14th.,1936) burnt off.

This also shows location of R's nest No.3, 1935 : In nearest oak on left-hand side of clump to left of center.

Thrasher song was maintained at its usual (present) level. Nova and Brownie are much in company. Nova was heard singing her odd song near the oval lawn. As B did not appear to be anywhere about, it seemed a good idea to see what effect I could produce upon Nova by attempted imitations of B's various whistled calls for her. On about the third effort a thrasher was seen a hundred feet away running toward me in the driveway. Of course it was B. Nova kept her place, continued her song, with B answering from my knee with closed bill, in a peculiar series of notes that I do not recall having heard before. In vocalization, an extraordinarily versatile bird.

September 15th.

Thrasher song as usual.

A cursory survey of Rhody's northeastern territory about 9:30 A.M. brought no results.

Two hours and Ten Minutes with Rhody.

At 2 P.M. I looked down over the same bank where he was located yesterday morning, but at a point about 150 yards further south and nearer home. I had accidently hit upon the exact place, for there was Rhody sitting on a rock below me looking off over Dimond Canyon as before. He seemed to have no business in hand at all. I went down to him; he rattle-booed in recognition of my coming, but did not stir. I sat down 30 feet from him. He booed again. I exhibited the closed worm box. He took the hint at once, booing twice more. (Yesterday he was absolutely silent). as he came for worms to be tossed to him to catch on the fly.

I now left the initiative entirely to him in order to see how he would comport himself. He moved off 20 feet and resumed his watch over the canyon, reacting to every sound and moving shadow. He is much more alert when afield. In about 10 minutes he came back to me and sat near my feet, back toward me, and continued to look and listen. I rewarded him with more worms. He again went off and again returned as before. The same action was again repeated, but this time he wanted no worms. He went around behind me part way up the bank, which pointed him in this direction. Accordingly I went up to the street and sat on the running board of my car. He could not see either the car or me from his place on the bank. A white cat came out to the sidewalk across the street. Rhody came up, saw the cat, and began a series of upward jerks of head and tail and pivotings about a vertical axis. The cat crouched and approached slightly. Rhody came around to my side of the car and stood watching me in the middle of the street. A rapidly approaching car applied its brakes on seeing him. R retreated to the curb, only.

Next he strolled casually in the general direction of home. (Not visible from where we were). The cat followed a few feet then quit. While Rhody was inspecting automobiles lined up on a side street en route here, I hurried back to have a mouse ready for him; the idea being that he had meat in mind and would go directly to the cage for it and have no space for mice, whereas I wanted to see if he was completely "off" mice as he was yesterday.

I beat him to the cage, but could see him running rapidly toward home across lots. I feel certain that he had the meat-picture in his mind, for he started to pass by me to enter the cage when I showed him the mouse. This he took, but immediately entered the cage after eating it and stood looking undecidedly at the meat. I had broken into his preconceived plan and he could not immediately readjust his faculties to the new situation.

He came to the wire facing me to think it over. (I do not know what else, for he would take nothing from me and remained stock-still). In a few minutes either the mouse had "settled" or he had evolved a new plan, for he went back to the meat dish and swallowed one piece. More thought was required, coupled with inspection of the remaining two pieces first with one eye and then with the other.

The solution appeared to be to get a drink. This accomplished, ascent to the upper compartment of the cage followed. It proved to be too hot there, so he shifted to a cooler place, panting. Preening followed, with loss of three feathers. (He is still moulting).

When he came out at 3:40 I resolved to solve the question of his present roosting place unless it developed into too stiff a task. As a matter of fact it consumed exactly 30 minutes; a maddeningly deliberate progression by Rhody over a long familiar route landed him, exactly at 4:10, in his old night-roost in the oak on the west lot. He had shifted his place in the tree about 6 feet and was almost invisible from the ground near the tree. From my customary position on the sidewalk he was completely invisible. This may explain my failure to locate him in the tree recently.

The time seems early. (Temp. 71 deg., sunset 6:19). There was nothing in the weather to cause him to retire early. It was warm enough so that the spread-eagle sun-fit was in order just before he climbed the tree. Perhaps, as recorded in the case of Archie when I located him near Mills, satisfaction of hunger was the factor determining roosting time on this occasion. I will look up last year's notes to check roosting time.

. . . .

I find, curiously enough, Rhody's night roost was located in this same oak for the first time on Sept. 17th. last year and that he went to roost on that day at 4:58 P.M. It was also a warm day. (Temp. above given was for 4:10 P.M.).

Notes of Sept. 17th. 1935 make interesting reading in this connection.

September 16th.

"The fly again" About 8 A.M. Brownie came for worms. It was seen that "the" fly was riding around on his head. During the last few days B has occasionally been seen to jump into the air suddenly, run, etc. as recorded on previous occasions--a probable indication that he was being bitten by this fly.

About 8:30 I went to look for Rhody in his E. to N.E. territory, finding him at its southern end due east of here. He was again observing the scenery below and beyond to the east, but came readily (silently this time) for worms. For the next hour he loafed and looked, lying down part of the time--preferably in the shade. At 9:40 he began to work toward the street to the west, which I interpreted as a sign that he intended to come home.

He essayed to cross the street several times, but was deterred by passing cars and the presence of a cat (yellow this time) across the street. He was nervous and jumpy and made frequent hurried retreats eastward, only to return and watch for an opportunity to cross from the top of a ten foot-high bank which here forms the eastern boundary of the street, the street at this point being lower than his field.

I came home and waited at the cage to see if my interpretation of his intentions was correct. In about 10 minutes he was on top

Kodachrome Test.

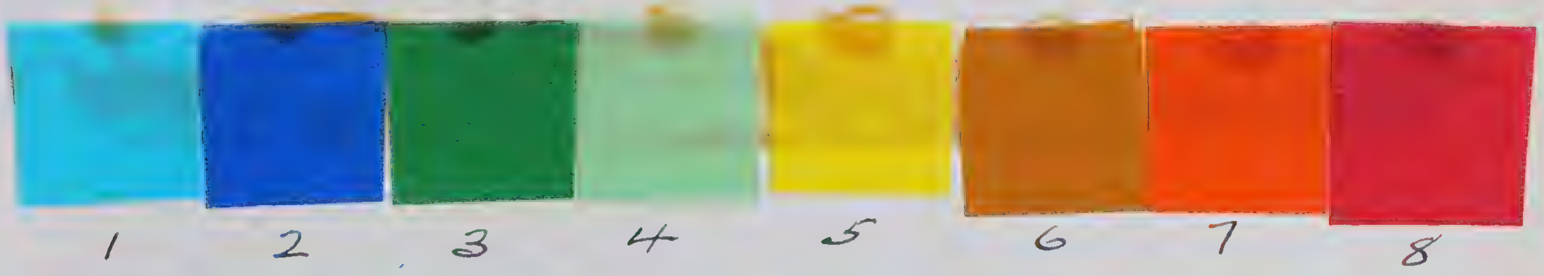
Sept. 16th., 1936

A rough test was made to determine approximately the effect of varying the time of exposure, in a motion picture camera, upon color rendition of Kodachrome film.

A "spectrum" was made up of colored pieces of crepe paper, and these were mounted on a piece of cardboard and set up before the camera in full sun, in such a way that the image occupied one half of the field of view, the other half being cut off by means of a mask back of the camera lens. When the resulting film is developed one half of it will be occupied by the spectrum as photographed with differing times of exposure; the other half should be without color of any kind and perfectly transparent.

When the film is projected, this half should transmit only white light and the same artificial spectrum used in making the film will be placed on the screen in the white lighted space, the other half of the screen being occupied by the Kodachrome image of that spectrum simultaneously. Thus, as the film is projected, there will be, on one half of the screen, the original spectrum as viewed by tungsten light of unvarying intensity and quality (if the unexposed portion of the film comes out uniformly clear and uncolored). On the other half of the screen there will appear simultaneously the photographic reproduction of that spectrum as made in sun-light and as projected by tungsten light. These colors are expected to vary with the time of exposure and a direct comparison with the original will be thus available.

The colors used were:



The paper was made by C.A.Reed Co., Williamsport, Pa. That company's trade designations of the colors, from left to right is: 1, Azure blue No.541; 2 , No designation on package, but it is approximately ultramarine; 3, Xmas or Emerald green No.533; 4, Nile green No.531; 5, Canary yellow No.552; 6, Golden yellow No.553; 7, Mandarin orange No.554; 8, Xmas or flame red No.571.

An attempt was made to match these colors against Ridgway's color charts and thus give them standard designations, but it was found impossible to make satisfactory matches, especially with the greens. The other colors correspond (very roughly) with Ridgway's as follows: 1, Bremen blue; 2, Ultramarine; 5, Lemon chrome; 6, Orange chrome; 7, Scarlet; 8, Spectrum red.

Exposures were made between 3:15 and 3:35 P.M. on the 16th. ist. in direct sunlight, the weather being bright and fair, temperature about 75 degrees. The spectrum was place normal to the sun's rays to minimize effect of high-lights and shadows produced by the crepe texture of the paper. The camera was placed about 6 feet away and, as nearly in line with spectrum and sun as was possible without having its shadow cast upon the subject.

Readings were taken upon each color of the intensity of light coming from it, in foot candles, by means of a Weston photronic

light meter. The indications were not altogether satisfactory, checking and rechecking showing some discrepancies and inconsistencies. However, they were:

No. 1, 250; 2, 145; 3, 145; 4, 225; 5, 250; 6, 225; 7, 190;

8, 190. (In April 1937 this meter was found to [illegible] reading much too low. It was [illegible])

Under the same conditions of illumination the paper on which this is written (using several thicknesses superimposed to avoid greying effect of transparency) is about 400.

The camera used, a Cine Kodak Special, is equipped with variable shutter openings as well as with variable speeds. Since in using masks it is desirable to use the larger diaphragm openings (according to the manufacturer, I do not know why at present) and the purpose was to try out the effect of a wide range of exposure times, in order to note the effect of both excessive under- and over exposures, use was made of the variable shutter opening as shown in the following table:

Diaphragm used.	Shutter opening.	Equivalent f-no.
f.1.9	Full	1.9
1.9	½	2.8
1.9	¼	4
5.6	Full	5.6
5.6	½	8
5.6	¼	11
16	Full	16
16	½	22
16	¼	32

This gives a range of diaphragm openings from f.1.9 to f. 32, as shown by last column and will insure exposures of normal time as well as excessive under- and over-exposures.

As the camera was run at the standard speed of 16 frames per second throughout the test f.11 , under the light conditions existing at the time should, if the manufacturers' recommendations are correct, give the truest rendition of the color values.

Exposures were made of 4 feet of film for each of the nine equivalent stop openings, in this order:

1, f.11; 2, f.8; 3,f.5.6; 4, f.4; 5,f.2.8; 6, f.1.9

7, f.16; 8, f.22; 9, f.32.

The first 6 exposures (in the first line) should give rendition ranging from correct (f.11) by gradual steps of over exposure to extreme over exposure at f.1.9.

The next three exposures (in second line) should give rendition ranging from slight under-exposure (f.16) to extreme under-exposure at f.32.

That is if the makers' recommendations are correct and the color balance of the film ideally perfect. However, it is expected that the result will show that different colors, to be correctly rendered, actually require different exposure times.

In other words, it is anticipated that the experiment will demonstrate that Kodachrome film cannot give correct color ren-

dition of all of the colors in this "spectrum" with any size of diaphragm opening simultaneously. Which is to say that the film can not give proper values for all of the colors in a scene, under any conditions, when that scene is projected upon a screen with tungsten light and the exposure was made by sun light. (I know this already, before the film is developed). The best that can be expected is approximate color rendition.

It will be not less than 2 weeks before the film is developed. Sept. 16th.,1936.

A correction to paragraphs 2 and 3 on page one.

Referring to paragraphs 1 and 2 on p.1.: This is incorrect; one half should be black not transparent, hence this half should show black on the screen. When the spectrum is placed there it will have to be illuminated by means of high temperature tungsten lamp from a flood-light or another projector.

Since the original memorandum was written, advices have been received from the Weston Co. stating that the film speed 8 should be used on their instrument in connection with Kodachrome.

Referring now to the readings actually taken on the various colors, the correct exposures for each of the colors at the time the film was run, would have been, by Weston meter:

No.1, f9; No.2, f6.3--7; No. 3 same as 2; No.4, f8--9; No.5, f9; No.6,f8--9; No.7,f7--8; 8 same as NO.7.

Or, put in another way:

Azure blue and lemon chrome take the smallest stop, that is the least exposure and the same, f9.
Nile green and orange chrome somewhat larger ,f8--9.
Scarlet and spectrum red still largerr, f7--8.
Ultramarine and emerald green larger still, f6.3--7.

That is: as anticipated, different colors require different exposures.

It will be noted also that the Weston readings call for more exposure than the manufacturers of the film recommend.

December 20th.

Development and projection of the film as planned showed briefly the best general rendition of color at f11 and f16.

F16 was equal in color to f11, but a little to dark pictorially, i.e a little too dense.

Without going into detail as to each color, it should be said that at no time was the emerald green even fair. At best it was a muddy olive green and ranged from brown to black.

This may have been due to defective processing, for I have, at times, secured good greens. At present green is the "sticker".

Incidentally the "black" side of the film with the smallest stops showed purplish. (Due to diffraction at the edge of the mask? Eastman cautions against small stops with masks).

of the cage and followed at once when I walked toward the shop, where he had his mouse.

Rhody's long rest.

A half hour later he was up in an oak, where a pair of wren-tits began to wind their rubbery ratchets at him.

For several days now he has not been seen in his formerly favored acacia.

12:10 P.M. Rhody has not stirred from his perch in that oak.
12:40 " No change. (Temp.73 deg.).
1:05 " " " " 74 "
1:30 " " "
1:55 " Rhody no longer in the tree, but he had visited the cage and eaten two of the three pieces of meat in his dish. He was not in sight anywhere. Finally I decided to inspect every corner from the inside--usually not necessary as he can be seen from the outside of the cage when there. However I found him tucked away on an obscure shelf(I had made for A and T, but which they refused to occupy) lying down, tail placed vertically against the wall. An unprecedent location for him and one in which one would not usually think to look. Now I wonder if this has an especial significance.

A new place for Rhody.

hody accurately uges his stomach capacity.

At 4 P.M. I came upon Julio trying to induce Rhody to eat a, mouse. Although the bird had followed him to the mouse station readily enough it gazed with indifference upon it. I told Julio that Rhody wanted a mouse but that that one was too large and Rhody knew perfectly well what would fit properly into the vacant space. He wanted a smaller one. So Julio got a very small one and Rhody was interested the moment he saw it coming, taking it at once, eating it and leaving promptly. That was enough for the day. Rhody's eye estimate of the size of an animal that will exactly satisfy his appetite is extraordinarily accurate. This has been shown repeatedly. He does not eat frequently, and never for the mere pleasure of eating.

September 17th.

B's nesting instinct reviving.

9:20 A.M. Brownie has been singing loudly outside for the last hour or so, near the oval lawn. It seems that his nesting instinct is becoming aroused, as he has also been taking small twigs up into one of the trees.

Nova singing too.

During the whole forenoon he and Nova, who is becoming a more frequent singer, sang frequently.

R's meals. today.

Too many distractions today to check up on Rhody, but he got meat at the cage once in the morning, once about noon and once about 4:30 P.M. at which time Julio informs me R followed him to the shop-yard for his mouse. Toatl known food: 3 pieces of meat, one mouse.

R's bedtime.

Allowing a half hour for him to reach his bunk would put him there at about the same time as on the same day last year with the same margin before sunset under similar weather conditions. (Max. temp. of the day 83).

September 18th.

Rhody, when not hungry, regards lizards, mice merely as interesting exhibits.

Rhody made two trips to the cage for meat up to 2 P.M. When he came out the second time he came and stood in front of me, although he was not especially interested in worms.

Big mouse refused.

When I went to the shop he followed slowly. A mouse was offered. He did not budge. Next a blue-bellied lizard, which played 'possum at once. R did not shift a foot. Next a tiny young mouse. Not interested. All three creatures were now before him at

Lizard ditto.
Little mouse ".

Unmoved by display of luxuries.

the same time, since none of them showed any disposition to run away. All were within 6 inches to 2 feet from him. He kept his place unmoved by this display of luxuries. I was now down to meal-worms. Rhody would neither catch them nor pick them up. Plainly he knew that he was full, yet he remained, perhaps in hopes of a miracle of some sort, or possibly a chance for some sport.

Rejects sporting opportunity offered by mice.

Lizard interests when moving.

The mouse began to move off. R watched with interest, saw it disappear, but did nothing about it. The tiny mouse now began to crawl off. The motion attracted R's attention, but he did nothing about that either. After a minute or two waiting he took a couple of steps toward the lizard and stood looking down at it. Finally the lizard bolted, R after it like a flash. But when it stopped, so did R. This was repeated. This time the lizard crawled under some leaves right under R's nose. R pretended to look for it every where else. I dug the lizard out. R "looked surprised", lost interest and wandered away.

Now why did he follow me to the shop at all if he wanted nothing? Acquired habit? Curiosity, or what?

R recovers appetite.

At 3:55 Rhody had recovered his appetite sufficiently to get the last piece of meat from the cage. Also he lost no time in following to the shop-yard where the lizard was again offered him. His interest was keen this time, but he tried too much of his fancy business and the reptile escaped and Rhody could not find him. I therefore consoled him with a mouse, with which he took no chances.

September 19th.

"The" fly stabs B.

When sitting on my knee this morning Brownie undoubtedly received a stab from, I suppose, "the" fly, for his reaction was in accordance with his approved standard: a quick leap into the air, precipitate flight, a short period of tense waiting, then return to normal, which in this case meant coming back for more worms.

Rhody illustrates acute hearing of RRs.

Rhody illustrated what I take to be the acute hearing of road-runners commented upon in connection with Archie and Terry in these notes.

R was standing with back not quite squarely turned toward me 20 feet from where I was sitting, looking off over the field below and to the south. Suddenly, without preliminaries of any kind, he dashed toward me, stopped at an accumulation of dead leaves on the ground, listened intently a moment, then quickly scraped the leaves aside and pulled out a large spider which he swallowed without preparation. The spider was 15 feet from his starting point. I do not think Rhody saw it at all, but heard it. Road-runners are "always" listening.

R kills yellow-jacket but does not eat it.

A few minutes before a yellow-jacket buzzed behind him. A quick turn, one snap and it was killed, no further attention being paid to it. As noted long ago, he is afraid of these insects and apparently does not consider them favorably as food, whereas Archie, Terry and all thrashers at this place eat them. (Or rather, A and T did at first, but lost their taste for them wholly or in part, in due course. Perhaps with growing experience.

R's bedtime.

Rhody jumped across the space from the "ladder" tree to his roost in the regular oak at 4:35 P.M. (Temp.73; clear;windless).

His roosting time on the 15th. was probably early. Under similar weather conditions, satisfaction of hunger seems to be

the factor that determines what shall be done with the last hour or so of daylight. (Sunset 6:13 P.M.).

September 20th.

Brownie's nesting reflex.

Brownie's full song was first heard about 6 A.M. Several other thrashers were singing in the distance at the same time.

About 7:30 he made his first call on me for worms. Nova was nearby. About 8:30 a patter of feet behind me where I sat at the oval lawn announced B's second application. While sitting on my knee he talked with Nova about 15 feet away eating seeds at a feeding station. His next move was to pick up, shake and drop twigs and examine the nesting site that interested him on the 17th. There he tried to rearrange growing twigs to his satisfaction. Thereafter he, also, fell to eating seeds.

B talks to N. Nesting.

B and yellow-jacket.

This was followed by vigorous and successful pursuit of a yellow-jacket. It was eaten after prolonged preparation.

Three and a Half Hours with Rhody.

Long rest by R in another tree-- rejects mouse.

At precisely 11 A.M. Rhody followed to the mousery, but his earlier foraging must have been very successful, since the most he would do was to pick up a mouse and then drop it, then climb the acacia that overhangs the shop yard. (Temp. 80 deg.). There he remained resting for exactly 2 hours and 57 minutes. This acacia (Acacia melanoxylon) has denser foliage than the one he formerly used under somewhat lower temperature conditions and which he abandoned when the days became hot. The supposition is that the present tree gives him the optimum distribution of light and shade under the conditions prevailing during his stay there.

Chooses meat.

When he came down (Temp.73) he ran past me in the direction of the cage. I invited him to follow me for a mouse. He stopped and seemed to consider the matter, but the meat won.

Hot surface effect in sun-fit.

Temperature conditions then called for a spread-eagle sunfit. I have several times meant to record the impression that a hot surface also seems to favor this type of sunning, but have forgotten until reminded of it again by his action. This act was followed by the usual neck-scratching, after which he joined me in the shade and topped off with worms for desert.

Sunfitting of spread type uncomfortable?

Spread-eagle sunning seems to be attended by a certain amount of discomfort to the bird. It usually causes panting and practically always a retreat to the shade. Its object may be, as I have surmised, to cause vermin (if any) to retreat to accessible regions.

A hot surface on which to lie would seem to fit in with this theory.

R has some blue scuta.

For some time it has been noted that the scuta on the anterior surfaces of his tarsi were in process of changing from yellowish horn color (by shedding?) to a light slaty bluish. (Brooks says: Horizon blue). All but about two of the 7 (?) or more are now bluish. In time they will undoubtedly change to horn color, since that is normal. (See p. 1269)

R now prefers mice.

Swallowed alive.

At 2:25 Rhody reversed his former attitude on the mouse question. I found him having a huge drink. After he had finished a rather long job he was more than willing to follow me. There was no finicky monkey-business about this mouse; he knew that he needed it and in no time Rhody's breast feathers were fluttering from the internal commotion. Drowning I suppose. Or, Being squeezed to death and smothered

September 21st.

Road-runner near Lake Chabot

This morning I went out to the territory where Archie was released, near Lake Chabot, and followed a seldom used road inside the reservation, which follows along the top of a ridge in typical road-runner country. Their tracks and droppings were found at many places and one road-runner was seen. This bird was very wild and sought cover in the chaparral at once. This was about a mile from where A was released and several hundred feet higher.

Thrasher song "everywhere".

Thrashers were singing all about and, during the two hours I was there, there was seldom a time when they could not be heard. Judging by Brownie, the active part of the moult (when feathers are actually being lost) is finished and there is a revival of song.

Rhody was not seen during the day, but he visited the cage three times for meat.

A new hazard for Rhody.

A new hazard has been introduced locally now: a police dog at the house across the street. Rhody is afraid of it.

September 22nd.

Thrasher song.

Thrasher song continues to be heard in all directions .

R changes morning territory.

Rhody seems to have abandoned his morning territory to the north east. I have not seen him there for several days.

R unusually nervous.

This morning he was found in his old place in the west lot, coming to the fence at once to reach through the netting for worms. He was extremely nervous, though apparently not afraid of me, raising and lowering his crest and tail constantly, starting at every sound, listening intently and peering in all directions through the openings in the surrounding growth. The dog above mentioned was lying in front of the house, but out of sight. I am inclined to think that Rhody has had some disagreeable experience with it. Certainly I have not seen him so wary for a long time.

R's moult unfinished.

It was noticed that there are many short pin-feathers in his crest. His tail feathers have not all grown out to full length as yet, so that the pattern of white spots is incomplete.

B's moult ditto.

It was also noticed a few minutes later that Brownie has some feathers in his wings that have not yet grown to full length.

September 23rd.

Much thrasher song. Full and sub.

Much song by Brownie during the day, especially in the morning. Most of it was full song from high places, which seemed to more or less directed at distant birds, but some of it was under-song while sitting at ease in the hedges and low shrubbery. This seemed to be for his own benefit, although it may have been intended to keep in touch with Nova.

New call by N.

Nova developed a strange, new call that did not sound like a thrasher's at all. She seems to be an anomaly amongst thrashers in song.

R has a meat-day.

Rhody wanted no mice today, preferring meat and refusing to follow me to the shop-yard on the one occasion when I invited him there.

September 24th.

Brownie's song began long before sunrise. (Sunrise 5:59 A.M.)

A warm search
or Rhody ends
y his being
ound at home.

I looked for Rhody at his various haunts about the vicinity for about an hour, up hill and down dale, returning here about 10 A.M. dripping with perspiration (Temp. 80). There were no signs of him, but as I stood gazing into the cage, he slipped out of the bushes behind me, acknowledged my presence by raised crest, displayed colors and a pirouette and headed stubbornly for the inside of the cage to get his meat and a long drink. He would not consider changing his mind once it was made up in favor of meat. Rhody is pretty "sot" in carrying out his intentions and seems to know fairly definitely what he wants(except when his reflexes and instincts are all mixed up during the mating season).

hody is pretty
sot" in his
[illegible]

Next trial was made of the upper annex of the cage as a resting place, but it proved too hot, so he came out to join me in the shade and catch worms.

R goes to in-
vestigate quail
isturbance.

Loud pitting by quail down on the street next demanded his immediate attention and he was off like an arrow. When I arrived there all excitement had subsided and R was sitting on the curb trying to decide what next to do. An aimless stroll up the street for a hundred yards or so, with pauses to view the scenery and occasional sudden short dashes to catch grasshoppers again left him without any pressing affairs confronting him, hence return here was in order. Part way back he must have decided to investigate the new dog-hazard, for he suddenly ran directly toward the new house, following the curve of the street, then proceeded to advance cautiously toward the open doors of the garage. These doors are at street level and about 30 feet from the curb. Thus Rhody had to shift his course about 90 degrees, so there is little doubt of his intention to investigate either the garage or the dog. The dog, for the present at least, keeps himself in or in front of the garage, and usually barks vociferously at all passers-by.

R decides to
ave close view
f the police
dog.

I stationed myself in a position to intercept the dog (who was invisible to me) if it became necessary to protect the bird in its expected retreat.

Discovers dog.

As Rhody approached the door he crouched low as if stalking game, but did not look into the interior with both eyes--only one. He suddenly stood erect and jerked head and tail upright, but did not retreat. He kept his place, repeating this gesture. I now saw the dog lying on the floor inside and aware of the bird.

akes insulting
estures.

og comes out.--
surprisingly
ild encounter.

It arose slowly and approached the bird, not at all menacingly, whereas I had expected a rush and a roar. My presence alone, judging by precedent, should have been sufficient to cause barking at least, and a big bird like Rhody, only ten or fifteen feet away, making what might excusably be considered insulting gestures, seemed to offer some incentive to positive action.

I thought Rhody would flee instantly in panic, but I was wrong there also. He merely retreated a few steps at a time, as the dog approached slowly, and stopped occasionally to repeat, his head and tail jerking with some side-stepping and about-facing. He was either very brave, very curious or very foolish, or, barely possibly, deriving some assurance from my presence.

As the dog continued to approach, Rhody worked around behind me, then up into the "chaparral" on my bank. The dog came only as far as where I stood, friendly enough, then retreated to his garage.

Rhody next came down behind me and the dog came out again. I then occupied a position about midway between them, 6 or 8 feet from either of them. They had a good look at each other--the dog

rather indifferent, the bird somewhat alert but not evidently frightened. Both retired with dignity, R to a tree behind me and the dog (a stranger to me, as is his master) to his garage.

When I went over to talk to Rhody the dog again came out, stood beside me and looked on only to retire again disinterestedly.

The whole affair was so void of animosity on the one hand and fear on the other, that I wonder if these two creatures have not introduced themselves at some earlier meeting and reached some basis of mutual tolerance. My presence. of course, may have had some restraining effect upon the dog and-though less probably--some moral effect upon the bird.

R ejects mice and disregards violent internal tumult.

About 4 P.M. Rhody followed to the shop-yard for his mouse. He was more than usually careless with this one and there was a violent commotion in his "innards" when the mouse struck bottom. Rhody seemed absolutely indifferent to this disturbance. He must be lined with boiler-plate. The feathers of neck and breast were strongly agitated.

September 25th.

R now forages in field to south.

Rhody's morning foraging was done in the field to the south. The tendency to use this field in the mornings now appears to be increasing. I gave him a very small mouse there--the only one he had during the day. Thereafter he preferred meat.

R, when full, gets careless with a lizard.

About 3:30 P.M., he having just filled up on meat, a lizard was offered him where he sat on top of the lath house. He brought it down to the ground , laid it down and began walking around it waiting for it to come out of its trance and run. The lizard showed no disposition to bolt, so Rhody took advantage of the interval of repose to do some preening. The lizard chose this time to pass out of the picture and into a clump of bamboo with such suddenness and speed that Rhody was unable to gather his wits together in time to enable him to overhaul the reptile. Consequently, although he was now intensely interested and searched diligently he was unable to recapture his prey, and I could not find it for him.

Lizard decamps.

R realizes error.

R loses.

R now re-exhibits a peculiar road-runner trait.

Rhody now, once again, as has been previously recorded of him and of Terry and Archie, exhibited that peculiar trait which impels him, on occasions such as this, to ignore the place where the escaped creature was last seen and go back and search at, or near the point where it was first observed. Thus Rhody now went inside the lath house where he could look up at the under side of the roof, for it was by reaching down through the roof of spaced laths and pulling the lizard out from under it, that he had caught it.

B and Nova.

During the day Brownie sang often, Nova being usually not far away. There was no further evidence of his nesting impulse.

September 26th.

B's talk once more deceives me.

At about 8:15 A.M. Brownie, who had been singing much since 6 A.M. or earlier, was working at the oval lawn, but came promptly to perch on my knee, eat worms and "talk". Nova could not be seen or heard. Again, despite earlier experience, I suspected the talk was for my benefit, but as before, it was for Nova. He was merely keeping in touch, as was proved by her coming out on to the lawn in a few moments.

B renews "nesting"

Brownie now renewed his nesting behavior and began to carry

Judging by mater-
al used, B's
ction merely
reflex.

small fibrous material up into the same place as on the recent previous occasions, and work on the surrounding growing twigs. The place is less than 6 feet from one of his last year's nests. (No. in the oak at the oval lawn).

From past observations activity of this kind can not be considered as representing serious intentions unless and until the material carried is of a character suitable for the sub-structure of a nest, i.e. composed of large, strong twigs.

ova ignores B's
ast behavior and
atches grubs.

Nova paid no attention to B's behavior and continued to extract worms and grubs from the lawn without damaging it.

After 10 or 15 minutes B's interest faded and he resumed full song, nearby wanderings, renewed applications to me for worms and contact-conversations with Nova.

During the rest of the day Brownie sang a great deal, as did Nova (for her) and other thrashers abroad.

Rhody behaved consistently with present trends, more interested in meat than mice.

September 27th.

B "works" at invis-
ible"nest".

Brownie again, during the forenoon, worked at his invisible nest at the same place and point as before, about 8 feet up in a cotoneaster (Cotoneaster pannosa). At present there appears to be nothing there, his work consisting principally in bending twigs (which flop back again) away from the preferred space.

B and N sing duets.

He and Nova sang duets most of the forenoon (other thrashers in the distance) and altogether the thrasher world was pervaded by an air of excitement.

B sing-digs after
long refraining.

Mimicry.

Brownie, at times, goes back to his early sing-digging and various types of undersong at times when he does not seem to be much concerned by the activities of other thrashers. His undersongs, as when first under observation, are often of long duration (ten minutes to half an hour or so) with mimicry reappearing (quail, hen, thrush, meadow-lark flight song, etc.).

Thrasher song-cycle
at peak(?)

Thrasher song cycle seems to be at its height, though the full songs are not of the highest quality heard from Brownie. They are inclined to be of the "imperative" type noticed previously. Nova's are still staccato and pitched high.

September 28th.

B takes first
properly select-
ed material to
"nest".

Brownie's nesting reflex is still more or less active. About 9:30 A.M., when he left my knee where he was sittting and eating worms after a long period of song, he carried a good sized twig up to his new nest space and fussed around with it interminably, so I left.

Police dog locates
hody's roost?

Mrs. Scamell called up a little later to ask if I knew whether Rhody was all right, as twice, she has seen that police dog standing up onits hind legs under Rhody's roost tree looking up into it.(This is about 200 yards from the dog's home). She had not seen the bird this morning.

I investigate.

I went down to have a look. The dog ran out, barked at me and followed me towards the Scamell house. I found Rhody just coming out into the street there. When he saw the dog he ran and flew down hill to the south west. I turned the dog back and went down to reassure the bird. R, sitting on a fence, waited for me to approach within fity feet, then came to meet me, taking worms

eagerly. When I turned back he trotted along behind to the Scamell's front garden. I then called Mrs. Scamell and pointed at the bird, of whom she is very fond, much to her delight. Rhody then climbed a sycamore tree at the sidewalk and composed himself for a good rest, after taking another worm or two.

Early in the afternoon I went out to where I saw him in the field and gave him a mouse. Perhaps as a result he did not come to the cage at all for meat during the day. The meat and the numerous grasshoppers and other insects he caught rendered it unnecessary.

Waiting for Rhody to roost. Test to determine if presence annoys. Does not.

About 4:30 I went to his tree to observe his going to roost. I gave up about 5 P.M., thinking he had changed his mind, and left, but on my way back saw him headed for the ladder tree, so returned. He always has to sit in this tree for several minutes. I wished to see if my presence annoyed him at such a private moment, so approached him and held up the worm box. He unhesitatingly reached down into it for worms.

R's roosting time. (Late).

At exactly 5:06 he made his final move across the gap into his night roost. (Sunset 5:58. Temp. 60. Smoke from forest fires the last few days decreasing insolation).

September 29th.

Observations at this point will be interrupted for a few days due to the necessity of my going to Los Angeles on matters not connected with birds.

Notes interrupted. . . . .

October 5th.

I look up Rhdoy.

Arrived home yesterday at 1 P.M., having left here by motor, on the afternoon of the 29th. ult., driving down the San Joaquin Valley. About 3 P.M. yesterday I looked up Rhody, finding him standing in the middle of the street below looking at the neighbor' police dog! He seems to have the dog-complex.

Rhody and dog.

When he saw me he cocked up head and tail in greeting and moved toward me at once, but the dog also approached and Rhody ran off to the west, climbed up the bank and disappeared somewhere in my grounds. In lookingfor him I nearly stepped on him, but, after a momentary start, he caught tossed worms expertly and then trotted after me dutifully to the mousery a hundred yards away, where he accepted the first mouse offered.

Julio tells me that he had a mouse per day during my absence.

Road-runners at Los Angeles Country Club.

At Los Angeles I put up at the Los Angeles Country club, getting the same room that I had occupied for seven years and had left 11 years ago.

On going out for a look around shortly after my arrival I was delighted to meet a road-runner foraging in the rough near the 18th. green of the North course. He was catching fat, pulpy worms that were crawling about in the rough grass and was not alarmed by my presence 30 to 40 feet away--only "careful". As if to confirm observations upon Rhody here, he did the "open bowl sun-fit"for me. This caused me to note that it was pleasantly cool with a breeze coming in from the ocean--in fact it was not hot enough for the spread-eagle pose.

Across the barranca a hundred yards away was another road-runner. In seven years of residence (continuous) at the club, during

which I had explored every inch of the several hundred acres of the property (both voluntarily and involuntarily) I had seen very few of these birds and never any so close to the club house. Inquiries of the grounds and greens keepers (all of whom were there during my period of residence) confirmed the fact that road-runners are now much more plentiful within the property lines than formerly.

Road-runners adapting themselves to human activities.

All of which goes to show that notwithstanding that the surrounding territory has been rapidly built over (or perhaps because it has) the road-runner population has probably increased locally. The inference seems warranted that, where these birds are not persecuted, they will thrive in contact with man and his works and even seeks closer relations because--no doubt--of the favorable effect of mans' operations upon the food supply, where those operations are of such a nature as to supplement nature's works rather than the contrary.

RR territorial evidence.

While I remained at the club these birds could usually be found near where first seen and it further developed that they were even supposed, by certain of the non-ornithogically inclined outdoor attaches of the club, to have pretty definite territories. E.g.: "There is a big fellow always near No.6".

oad-runners in ther gardens.

My friend John Black has been developing a gardeh for several years in advance of building a home there, in the Riviera district on the edge of Santa Mònica canyon and road-runners are "always" messing about it. He now has a house under construction and these birds were there when I accompanied him there on the 3rd.

On the same day I started up the coast, passing through Santa Barbara, where my friend Robert Easton also has road-runners (perhaps only one) in his garden. This bird has been suspected of eating his young quail.

RR and snake.

50 or 60 (?) milesbeyond Santa Barbara, near Los Alamos, the same day, while driving along the highway at 45 miles per hour, I passed a road-runner only 20 feet away, killing a snake in the depression by the side of the road. For more than a mile I kept on, but the attraction to the rear was too strong and I turned back. The bird was still there and was in the wooden attitude that Rhody assumes just after having swallowed something very big, and his neck was "stiff". No snake was to be seen, yet I had clearly seen it in the bird's bill being slapped vigorously upon the ground as I passed. Doubtless he had mastered it. This bird was not alarmed by my presence either to any great extent. He allowed me to pull up beside him in the car, get out and approach to within 20 feet or so, merely walking slowly away.

At this point a sparrowhawk suddenly stooped at him without striking, but coming within about 6 inches of him. This was repeated several times from a height of about 6 feet, the hawk never actually striking and the roadrunner merely side-stepping and crouching, but not running and not fighting back. I was not over 20 feet away. My presence probably "cramped the style" of both birds. The hawk flew up to a wire and perched there. I then threw stones at him until he left the scene. The first stone only excited his curiosity and he seemed tempted to catch it.

When I left the hawk had gone and the road-runner was still not more than 40 feet away, walking off slowly crouched close to the ground.

One wonders what the real intent of the hawk was.

During this absence of mine not a thrasher was seen or heard, yet those in this vicinity remained as usual (Julio) and Brownie

now (11:30) A.M. is singing outside and others can be heard in the distance.

Brownie's hot feet.

A few minutes ago he was sitting on my finger eating worms and it was noticed that his feet were very hot. This has been observed before, and it has been suspected that such high temperatures might be indicative of reproductive excitement, but I doubt if such is really the case. In the present instance he had just been sitting on a bare, black stub of the old oak and it was probably pretty hot superficially. "The" fly is still with him.

"The" fly.

About 8:30 A.M. Rhody was out in his foraging field to the south. He was pleased to have meal-worms to add to his fare, but wouldn't come home.

The police dog sniffed me up and down. I could feel his breath through my thin trousers. I hope he has stored my scent away in his "approved" files. It will be better for him if he has.

About 1 P.M. Rhody gobbled all the meat in the cage.
" 3:30 P.M. Julio gave him a mouse. I did not know it at the time, so when I found Rhody out on the street about 4 P.M. I was unable to account for his indifference to my offers of worms.

R's roosting time.

At 4:12 he climbed the tree adjoining his roost. In about six moves, he crossed through the tree and made his final leap across to his roost at exactly 4:23½. (Sunset 5:47, fair, warm, light N.W. breeze). He is always as deliberate as this. It is a curious fact that this is the only tree that he enters from the outside, landing on the canopy and crushing down through to his roost. The adjoining tree is easier to climb and therefore furnishes the most convenient route to his night roost.

October 6th.

Rhody was not out in the open field at 8:30 A.M., but was found near his roost on the edge of the brush on the west lot. When I sat on the bank he came and stood beside me as long as I offered worms. He stayed there all the morning--an unusual procedure for him--and was not seen out foraging the whole day.

He was still there at 1:30 P.M., but came to the fence when called, though he retreated into the brush soon to investigate the activities of the quail.

Some time before 3 he ate all the meat in the cage. At 4:20 I looked for him at his roost, but as I could see nothing, climbed the bank for a closer view. He was already stowed away for the night. Evidently his feed at the cage left him with nothing more to occupy his attention for the rest of the day. (Sunset 5:46, bright, fair, warmer than yesterday; temp. at 4:30, 70 deg., max. during day 80). Temperature yesterday at the same time was not recorded, but it was about 62.

Without correlating observations made thus far, it appears that satisfaction of hunger is one of the important elements bearing upon the time of roosting,

It has already been demonstrated by earlier observations that the road-runner goes to roost much earlier than the general run of birds in this vicinity. It seems to be a fixed characteristic.

During the day Brownie sang much abroad(with his fellows ?).

dy's scuta. (Refer to note, p.1261, Sept. 20). It is now seen that Rhody'S scuta are all of light, yellowish horn-color, the blue now being confined to edges and crevices between scales, in the manner of what house painters call a "glaze". This is normal.

Early in my acquaintance with Rhody reference was made to a blue "garter" on each leg. These were merely bluish scuta (or places from which horn colored ones had been shed(?) symmetrically placed at the upper ends of his tarsi, looking like garters, although they did not go all the way around.

October 7th.

During my absence Brownie added nothing to his "nest" and since my return he showed no interest in it until this morning after I gave him worms. Early in my acquaintance with B and Greenie it was recorded, that, during periods of rest from nest building, feeding them would make them go back to work.

About 10:30 Rhody decided to follow to the shop-yard for a mouse. For a considerable period now his mornings have been given over to foraging (or resting) elsewhere.

He wanted no more mice during the day, only meat.

His roosting time was not observed.

October 8th.

Rhody again spent most of his forenoon in the west lot, for the most part under or near a bush where he would be inconspicuous, and at the same time, get some shade. These particular bushes (baccharis and old-man sage) are very dry at this season after the summer drought and Rhody blends in with them well. He can thus occupy what would ordinarily be a rather conspicuous position, such as at the top of a high bank near the street, see everything and yet not attract attention. I found him in such a place about 8:30 A.M. He came down and out to the street to catch worms tossed to him, retreating to his bush each time a car passed.

About 2 P.M. he had four good sized pieces of hamburger at the cage and a huge drink. It was too hot (85) for him to do any sunning whatever--shade was in order.

A large spider (probably either a trap-door spider or a tarantula--a vicious fighter it proved) was offered him; Apparently he had no space left for it, though he inspected it closely and watched it whenever it ran. Ordinarily he eats them. I gave him about three quarters of an hour to make up his mind about it, then called Brownie, who went off with it at once.

During this period Rhody, who was back toward me at the time, suddenly turned, ran toward me three feet and began scraping leaves aside with his bill about 2 feet from the spider. He unearthed a small white pupa incapable of locomotion. This he ate. Evidently it fitted the space better than the spider. Also, though it seems incredible, I believe he located it by sound .

At 4:14 I stood near his roosting tree waiting for him to come.

At 4:30, my patience exhausted (with the sun on the back of my neck) I decided that he would probably be found out in the street leaving home, and that is how it worked out. Why he should stand in the middle of the street like a statue is beyond me; but it is an old trick.

Three cars passing in rapid succession sent him off to the field to the south. Finally, in my company, he recrossed

the street headed for his roost, but, on reaching the west lot, came back out of the bushes again to stand facing me. (The answer to this was worms.

At 4:53, moving 2 or 3 feet at a time and listening intently, he entered the thicker brush near the ladder tree.

At 4:55 he jumped up into it and remained motionless for 2 minutes.

Altogether it took exactly 13 minutes to enter his roost in 7 moves, the last rest being 4 minutes and the one before 5. During the resting periods he appears to be almost frozen with neck stretched out to its fullest extent in the direction of his roost. The distance covered in 13 minutes was about 25 feet.

In roost at 5:08. (Temp. 77, Sunset 5:43).

It is probable that his roosting time was delayed 20 minutes or more beyond what it would have been had it not been for the automobiles and my offering of worms.

October 9th.

Rhody again chose the west lot for his morning loafing period. With considerable coaxing he consented to come down to the street, follow me to the entrance (with one slight detour to peek in at the dog with dramatic poses which left the dog unmoved) and up the driveway, edging by the postman's car, to the shop-yard for a mouse. The last part of his journey of 200 yards or more was made without coaxing when he realized its import. (About 10:30 A.M.)

After the mouse he retired to the shade 15 feet from me to rest I sat down to await results.

In about 10 minutes he heard a distant sound, somewhat like a cooing (source unknown). He flew at once to the top of a 6 foot step-ladder 7 feet from me and rattle-booed sonorously five or six times much excited. I got the impression that he thought the sound was made by a road-runner, though I did not think so. He sat on the ladder for about ten minutes, nervous and excited, listening and looking in all directions. A hawk (Sharpshin?) flew overhead about 50 feet up. Rhody immediately flew 15 feet to the tool-house parapet, rising 6 feet, as if to observe the hawk better. (Instead of retreating). This was followed by another upward flight ~~inclined at 45 deg. to~~ of about 5 feet inclined at 45 deg. to the pergola supporting the rails on which the observatory roof rolls. Thence upward another 6 feet to the roof. (Note the upward flights of which the road-runner is "incapable").

This is the first time for many weeks that Rhody has been seen on top of the roof of a house. Here he remained for 17 minutes surveying all points of the compass. Incidentally puffing all of this time with open bill. The hawk again sailed overhead, but he did not react to it, perhaps not seeing it. (Shade temp. 77).

He now sailed down 70 yards to the street 52 feet lower, passing over the tops of the trees. When I reached him he was sitting quietly on the curb, in the shade, with spread wings cooling off, with no signs of nervousness and no apparent objective in view.

In a few minutes he illustrated one of his very hen-like characteristics. An approaching automobile frightened him, so instead of slipping off into the bushes behind him, nothing would do but that he should dart across the street directly in front of it in order to reach this place.

It is interesting to watch the reactions of drivers under these conditions. Most of them have probably never seen a road-runner at such close range, or perhaps ever . They all register surprise and interest; some apply the brakes: some stop and ask

questions; almost invariably all look at the bird and then at me as if to see what I am "going to do about it".

Rhody's moult. Rhody appears to be in perfect plumage, with the exception that one of his two middle rectrices has still about three more inches to grow before it is of full length.

Brownie's moult. Brownie, also, is beautifully sleek and well feathered. I have endeavored to find out whether that missing flight feather in his left wing has been replaced, but have been unable to do so.
B is still bothered by "the" fly and that makes him nervous and jumpy at times.

As the mouse given Rhody this morning was a small one and he had refused to eat the freshly killed one that Julio put in the cage, I expected him to show up some time during the afternoon for a live one. At about 2:40 I found he had eaten the meat out from under the dead mouse, but was nowhere to be seen. I gave the mouse to the magpies, walked 40 feet to get some meat, turned back to the cage and there was Rhody inside, colors fully displayed, watching Oof working on the mouse.
On invitation he followed to the shop for a mouse. I gave him a large one, thinking he would want no more food for the day and that he would, in consequence, probably go to roost early.
He sat in the shade near me for a half hour (until 3:15) then started off on his regular route followed at bedtime.
At 3:30 he reached the west lot via the open street .
" 3:35 he jumped up into the "ladder" tree.
" 3:40 (Times to nearest half minute) he made his first move.
" 3:47½, his second move.
" 3:53½ " third "
" 3:56 " fourth,
" 3:56 plus, his fifth.
" 3:57 he jumped into his roost. (**Seven** moves from the ground).
It was an early retirement.(Temp. at time 74 deg.; bright and fair: sunset 5:42). The route followed through the ladder tree was, allowing for human fallibility, identical with that of yesterday. Each "move" on both days consisted of one jump, with the exception of the third (fourth from ground) where a convenient small branch enables him to "crow-hop" in the middle of the move.
The time required to reach his roost from the ground was, however, longer today than yesterday: 22 minutes as against 13. There was also far less tension in his attitudes. (Possible reasons He had just eaten heartily; he had not been frightened en route; I stood farther away; he was early and had plenty of time).

October 10th.

Rhody was again found on the west lot in the morning, this time at 8:30. Other engagements prevented my keeping in touch with him during the day.

October 11th.

I went to the west lot at 7:30 A.M. thinking to catch Rhody, who may get up at any time, still in his roost but he was not there Three quarters of an hour later, however, he was at his lookout station at the top of the bank.
He did not come for meat until about 3:40 P.M., topping off with a mouse. He started along his regular route for his roost, but turned back as if suspecting danger and went out the entrance at the eastern corner of the property. Turning west there, he

soon discovered the police-dog lying in the middle of the street. He approached the dog within 50 feet , jerking head and tail, then made a detour around him. Passing cars caused him to retreat several times up into trees on my south bank. One of them (at 3:58) he appeared to examine as a possible roosting place, as he examined the branches above him carefully in detail.

These interruptions delayed his arrival at the ladder-tree until 4:19. He again followed his usual route through the tree, but this time, took only 7 minutes to reach his roost, arriving there at 4:26. (Temp. 62, bright, fair). Sunset 5:39.

October 12th.

Much song by B during the morning, less during the afternoon. A large part of it was undersong.

Rhody was not located in the morning, but showed up at the cage at about 1:30 P.M. where he ate all the meat at one sitting, then spent the next few minutes drinking and making feints at the magpies accompanied by rattle-boos. On the latter occasions he does not usually raise his crest, but displays his skin-patch color to the fullest extent. Seen then a yard or two away with the sun behind ones back he is more than merely handsome, he is beautiful, with lustrous metallic reflections of blue, bronze green, old rose, purple and copper and conspicuous pattern on wings and tail of black and white with body feathers of black and tawny. His pupils are expanded and the brassy ring around them is less conspicuous than when his pupils are contracted, making his expression softer. His skin-patch is stretched tight, so that the crepe-like wrinkles are smoothed out and the red, white and blue are bright. His movements, though theatrical, are graceful and he is full of animation.

As Rhody had not reappeared at 3:30 I went to his roosting place, thinking that, although his meal of meat had been rather early in the afternoon, its size might have sufficed for the day.

At 3:40 he was already in his "third position" in the ladder tree and at 3:50½ he landed in his roost. (Temp. at 3:55, 70 deg.; Sunset 5:38; bright, windless).

I Wonder if his ability to get all the food he wants, whenever he wants it, has had any effect on his daily life pattern.

October 13th.

For several days, now, another thrasher has occupied a pine tree about one quarter mile south of here and sung all day. Brownie does not seem to respond and, in fact, all day his singing has been negligible.

Rhody was at his present morning look-out as usual. He had his meat during the afternoon, but wanted no mice.

I waited for him at the roost tree until 4 P.M., then as he did not appear, returned here to find him about ready to leave and having his second drink of water within the hour. (Referring to Dawson and others re RRs rarely drinking oftener than once in two or three days). As I had climbed up and down the hill and the bank several times I did not follow to observe his roosting time, though it was probably after 4:30. (Temp. 72/.at 4 P.M., Sunst 5:3

(In the forenoon I found mocking-birds singing at : Niles; between Niles and Decoto; Decoto; between D and Hayward at Cemetery of Holy Sepulchre; Hayward).

October 14th.

Brownie sang little, but the bird to the south sang all day again, B not paying attention.

Rhody not at his present morning lookout until about 9:30 AM. He filled up on meat at the cage just before noon, resting here until about three. He then followed to the shop-yard, but wanted no mouse offered; presumably all too large, and I had no very small ones left. A Jerusalem cricket was accepted instead. It seems that this was not enough for, after leaving, he came back and waited for something else (presumably). This he did three times so I gave him worms. This again illustrates what appears to be some judgement as to the bulk of the object for which he has sufficient "space" left.

Repeated visits to the roost tree up to 5 P.M. failed to disclose his presence, so I resigned the job for the day. (Temp. at 5: 70 deg ; sultry with thin clouds partly obscuring the sun), 5:35

Hawks back again.

For several days now the hawks (Cooper and Sharp-shin, have been back on the job. Their presence is reflected in the behavior of all of the birds, with the uncertain exception of Rhody.
Brownie especially is constantly on guard and singing little.

October 15th.

Rhody was at his lookout near the roost tree at 7:30 A.M., so I suppose he slept in his usual place.

Mockingbirds (In the forenoon I made another "motor, listening survey " of other places in Alameda County, finding mockers singing at Centerville, Irvington and Mission San Jose. In the Livermore and San Ramon Valleys there was extremely heavy wind and birds of all kinds had sought shelter. No mockers were heard there).

Got back here at 12:30, arriving just before the wind, which drove all the birds to shelter as elsewhere. Rhody had already come for his meat and wanted no mice. He did not appear near the roost tree until 4:15. Then, seeing me, came directly to me for worms. I went and got him a mouse, which he allowed to escape into the bushes before he got interested in it. He then tried his listening tactics, but they did not work. A hawk buffeted the wind above us in a splendid performance witnessed by R warily. The hawk at time was menaced by a humming-bird.

Rhody required only 7 minutes to cover his route through the ladder tree, landing in his roost at 4:54. (Temp. at 5P.M. 74 deg. Sunset 5:33, high wind, clear.).

The hawks are almost constantly present now.

October 16th. and 17th.

Brownie continued to be almost silent, except for talk to Nova and occasional sub-song of fine quality.
The other thrasher, to the south, except during the height of the gale which blew intermittently on these two days, maintained his song.

Rhody behaved without marked variation from established form,

except that, on the 17th. he used up 45 minutes in passing up through his ladder tree, arriving at his roost at 4:46.

Jays have "the" fly also.

On both of these days a California jay took the initiative in making my acquaintance, coming down from a tree to stand in front of me and wait for worms to be tossed to him, as it proved. As I have never encouraged these birds, it seems not improbable that he has learned by observing Brownie and Rhody. On more than one occasion "the" fly has been seen riding around on tôp of his head.

This bird was singularly confiding, considering the reputation I must have with the jays, and would stand in front of me and sing his curious little sùb-song and all but take worms from hand.

Brownie and jay.

B did not like this bird and was shy of him. In order to get worms from me in the jay's presence, Brownie would approach me only from the rear, so that I handed him worms behind my back. He was "wooden" whenever the jay was near me.

October 18th.

I visited Rhody's roost at 7:A.M., but he was not there. About an hour later he was occupying his observation post on the bank near it. A little later he was on the roof of the Fish home in the hollow a hundred yards south of here. He spent a couple of hours in and near their garden, looking into their living room window, flying up the wall and catching something under the eaves, followed by a long rest in the open field near their hedge. He was practically invisible at one hundred yards.

About noon a man with a gun, accompanied by two women, strolled along the sidewalk in leisurely fashion and, when opposite the Fish house, stopped and looked down toward it intently. I moved into a strategical position prepared to do murder if necessary (without weapons) but they passed on. Rhody, in the meantime, had come home, and was in the cage when I returned.

He ate half of the meat and then retired (after a good drink) to the upper annex for a two hour's rest.

(Five hawks were seen at one time overhead while he was in there)

When Rhody came out a little after 2 P.M. (after having another long drink) he passed by the meat dish and also refused mice.

He then spent another period of 2 hours in an acacia on the south bank. (The same one where he was reported as apparently looking for a roosting place on the 11th.). He did not leave this tree until 4:15 P.M. I really thought he had decided to roost there, but he went to his old place, jumping to position No.1 in the ladder tree at 4:33.

I watched him clinging to the nearly vertical trunk at that point for a bout 7 minutes, stock still as usual, when, as I turned my head to glance at a passing car, I heard a sudden rustle of leaves and a hawk flew swiftly away from the exact spot on the trunk occupied an instant before by Rhody! I hurriedly climbed the 20 foot bank. No Rhody. Also no feathers. I waited by the ladder tree, noting a little trail that he has worn to the point where he takes off for position No. 1: a knot on the trunk.

In about 5 minutes he came warily out of the bushes, not using his trail, looking at everything else but me, and perched on a baccharis branch a foot from the ground and 5 feet from me, 10 feet from Pos. 1. Here he spent about 10 minutes inspecting everything that could be seen from his perch without moving, but me. Listening, listening. I would like to think that he derived some sense of protection from my présence, but am inclined toward the view that his attitude toward me was less positive; that, in fact, I

was merely a well known fellow creature against whom no precautions need be taken.. Certainly, though he was in great fear, there was no fear of me. But he was afraid of every shadow, every bush and clump of leaves, every sound except one which he knew to be made by me. He did not dare to move in any direction without first assuring himself that the route was clear and the contemplated destination was free of enemies as far as could be ascertained by his senses from the spot which he occupied.

It was now past his bedtime and something had to be done. Would he abandon his old roost in view of his recent terrifying experience, or would he carry through as usual?

The route to Pos. 1, only 10 feet away, was free of bushes. It was the logical one to follow if he were to decide upon his regular roost. He did so decide, but instead of doing the obvious, inspected the bushes to his rear, went back into them, crossed over to the beginning of the trail I have mentioned and followed it to Pos. 1, a route two or three times as long, but the familiar one.

Thus, I suppose, does habit prevail even in time of emergency. He now followed his usual route to his roost, but intensely alert, making no move until satisfied the way was clear and each stopping point free of enemies. Before his final take-off across the gap to his roost his neck was stretched forward to the utmost peering into the dense foliage ahead with such concentration as to suggest that he was actually projecting his will power in advance to do battle with an invisible foe.

It now seems clear, after this episode, that there is good reason for Rhody's hitherto unaccountably deliberate actions in climbing to his resting place for the night. Is it learning from personal experience, i.e. intelligence, or is it a trait inherited from a hundred and fifty million years of ancestors, i.e. instinct ? Both, I think. Yet Brownie does not do it. Neither did Greenie. The quail don't. Archie did not when I found him out near Mills College. Rhody, Archie and Terry did not do it in the cage. Rhody did not with his other roosting places (Though this should be checked from the notes).

Rhody landed in his roost at 5:08. (Sunset 5:29, temp. at 5:08: 62. Rain threatening).

R's moult

Rhody's middle rectrix now lacks only about 1¼ inches of having reached full length. His tail pattern of 6 conspicuous spots is now fully restored to symmetry.

B's song, Duet with N.

Brownie's full song revived somewhat during the day. At one time he and Nova sang another duet from adjoining trees.

October 19th.

A chilly morning with rain still threatening, but not yet arrived.

Rhody was found at his lookout on the bank near his roost. When I approached him from the rear he faced about and came to me without being called. I tossed him 44 worms as fast as they could be taken, one at a time, from the box, beginning at about 6 feet distance and winding up at about 2. He caught every one without a single miss--some of them at awkward angles and moving through the air pretty fast.

He was perfectly at ease and there was evident no remnant of fear from last night's experience.

This lookout station of his is at the top of a 6 foot bank which forms the south boundary of the "west lot" at the corner of Selborne Drive and Sandringham Road. At that point the baccharis bushes between him and his roost have thinned out and he has

partial cover, although he is right on the edge of the sidewalk. Often, however, he stands right out in the open; but even then he blends in well with the dull green of the baccharis behind him and the dry grass around him, so that he is seldom seen by persons unaware of his presence.

Automobiles often pass along the street within 20 to 40 feet of him. Some cause him to retreat, others not. It seems to depend upon their speed and noisiness, and the state of his mind at the time.

He appears to be wandering less at the present time and, althoug I have looked for him farther away often, it has been several weeks since I have seen him more than about 150 yards from the boundary lines of this property.

Also he seems to be content with less food than formerly here. He is certainly eating less meat and fewer mice. Whether, in the aggregate, the amount of food consumed is less than during the mating season and the active moult, I am unable to say, since food is still abundant (lizards, snakes, insects) all about and there is no way of determining how much he eats on the outside.

I believe however that it is, as he does not seem to forage very actively now.

October 20th. to 24th., incl.

The threatening rain did not arrive during this period and temperatures went back to maxima of about 80.

Brownie's song continues negligible, though the bird to the south is often, though less frequently, heard.

The hawks continue on the job. The effect on Brownie is to keep him silent and concealed most of the time. When he comes out on invitation he scrutinizes the sky constantly and is ready to dart back into the bushes at the slightest disturbance made by any bird in the bushes or overhead.

Rhody seems little concerned by the hawks and his experience when going to roost the other night has not caused him to go to roost elsewhere. He does not hesitate to remain fully in the open whenever he feels like it for an hour or so at a time.

On the 20th. at 4:31 P.M. he was already in position 2 in the ladder tree when I arrived on the scene. He proceeded up and throug the tree in his usual cautious manner, landing in his roost at 5:08. He was very tense during and before the last two moves.

I did not check up on his roosting time again until the 23rd., when I found him already in his roost when I arrived at 4:55.

On the 23rd. I made another listen-look- stop survey of mocking bird distribution by auto on main highways, extending the area covered further to the south than previously: to Alum Rock Road running east from San Jose. Results are:

None heard or seen in Oakland.
" " " " " San Leandro.
Ditto San Lorenzo.
" Mount Eden.
" Alvarado.

1. First one heard 3 miles south of Alvarado and 2 miles north of Centerville.
2. Next one about ½ mile further toward Centerville.
3. " " in Centerville. (11:30 A.M.).
4. " " (several) 2 miles N. of Irvington.
5. Next several near school in Irvington and not where heard on the 15th.

6. One or more singing at Warm Springs.
Beyond Santa Clara-Alameda Co. line turned east on Jacklin Road--few houses--; south to Calaveras road , west on this road toward Milpitas.

7. Several singing 1.3 miles east of Milpitas.
None heard at Milpitas.
South of Milpitas turned S.E. on Capitol (o?) Ave. leading to Alum Rock Road via Berryessa. Although I have previously seen and heard mocking birds along this road, none were encountered until I turned E (Really N.E.)on Alum Rock road.

8,9,10. (3 stops). There were several singing along this road for the next half mile. Came out by Penetencia Creek (Evans Road ?) leading back to Berryessa.

11 One singing about 1 mile E. of Berryessa.
Turned N. on Sierra Road to Calaveras, E. and N. through the hills to Livermore, where, since there was no wind, I thought mockinbirds "ought" to be heard. (3:30 P.M.).

12 Several in a park (surrounding library ?) at Livermore.
Turned S. to Pleasanton where no birds had been located on previous visit, but found none, although this town would appear to be an ideal place for them--in fact about the most attractive of all.

On the 24th. the survey was continued to the north and east.
None heard in Oakland and Berkeley.
None at Martinez.

13 First (several) at Concord.

14 Next on road to Mt. Diable about 3 miles from Concord.
None at Walnut creek, Alamo, Danville, San Ramon, Dublin.
Had another try at Pleasanton, making a thorough listening survey through the residence part of the town. They "ought" to be there! None.

October 25th.

About noon Rhody showed what appeared to me to be the first evidence of concern about hawks when none were actually in sight. He had been to the cage for meat and was following me to the shop, but instead of continuing in the open as usual, ran quickly from bush to bush, diverging from his course in order to seek shelter.

He did not, in fact, follow all the way, so I went to him with a mouse. This he took from the palm of my hand, but allowed to escape and made only a perfunctory effort to find it.

When I left him he was sitting quietly in the glade under the bushes.

About 1 P.M. Brownie was getting worms from me in the glade. Rhody saw what was going on and came for his share, B retreating to a branch behind my shoulder. Rhody frequently glanced up at him, and whenever B made a quick movement (which was seldom) R was startled. R finally wandered off. So did B.

About 1:30 I was looking for both of them when a hawk, thought to be a female Cooper, darted swiftly along the driveway close to the ground. I renewed my search at once for B and R, and strangely enough, found them both in the open quite composed. It was as if both had been aware of the presence of a hawk in the vicinity and its appearance and departure had relieved the tension.

Brownie now put on a fine performance of sing-digging in the

glade near me. He seemed utterly absorbed in the work and sang happily. It seemed to me that the song indicated his sense of well being and nothing else. Yet, after it had been continuous for a half hour, it ceased abruptly as Nova ran up behind him, and was not heard again as long as I remained, though Brownie continued his digging after one hasty glance to see who it was 3 feet behind him. I had not see or heard Nova before during the earlier hours. Her coming (followed by silent digging on her part) evidently silenced Brownie. Consequently it seems that his song had something to do with her, possibly merely a contact song or location song,--whatever the name for it is.

October 26th.

Returning from down town about 12:15, I saw Mike, the Italian who works on the tract, indicating that he wanted to speak to me, so I stopped. He was much excited and pointed toward the entrance, saying something about "very long","maybe kill somebody","over there, I show you". He then measured off a space of about two feet on his arm. I expected to see a rattle-snake, but, instead it was a scattered mass of Rhody's feathers. This was a shock. Six of his beautiful tail feathers, numerous upper and lower tail-coverts, four flight feathers, wing coverts and rump feathers. No blood. No Rhody. I began a search and found him, large eyed and solemn up in the acacia that he affects and from which he can observe the dog. Four slim feathers only in his tail!

I examined the dog's mouth. No feathers.

I tried to coax Rhody down, but he would not come. As he seemed safe, I left, returning a half hour later to find him gone. Search disclosed him out in the open near the Scamell house, not showing any fear. He came to me readily and took meat from hand, saying: "Ook, ook, ook" very softly--the first comment from him for a long time when coming for food.

There was no blood to be seen though he was mussed up considerably aft, and his magnificent tail a wreck.

About 1:15 P.M. he headed for the west lot and his roosting tree, walking across the street with no evidence of fear. I went into the bushes by the ladder tree to see if he really intended to go to roost. I found him sitting quietly in a baccharis bush staring fixedly in one direction. In about 15 minutes he went out toward the street and contact with him was lost.

I had to leave for the afternoon, but Julio says he went to the cage and got more meat.

This episode seems to fit in with the renewed hawk activity here, but considering everything, I believe he got too careless in the presence of the dog and that the dog seized him but not effectively. I shall see what can be done about restraining this animal's public activities.

October 27th.

Rhody was not seen here all day, could not be found at any of his known haunts, did not come for meat and, up to long after sunset, did not appear at his roost.

Consultation with the city attorney disclosed that the dog's presence on the streets not on leash is counter to ordinances and that effective corrective measures will be taken and a report made to me of action taken. So far so good.

October 28th.

Rhody still absent. No Rhody anywhere today, and his roost was watched until after sunset (5:16 P.M., temp. 67).

Two pieces of his meat disappeared from the cage between 2 and 2:45. He may have taken them, but he was not seen to do so.

B's sub-sings only. Brownie's full song was not heard, though he continues to sing-dig and sing sub-song in the glade for long periods at a time.

B not building nest. Brownie has not resumed his nesting behavior since last recorded herein.

October 29th.

hody found safe
nd sound.

At 1:15 P.M., after visiting all of Rhody's known hang-outs, he was seen down in the hollow near the Fish house. I went down to him and gave him a live mouse, then worms.

He misses bracing
effect of tail.

While he was catching worms it was noticed that the three remaining feathers in his tail did not give him the support that he usually gets by using his tail as a brace against the ground. He was unsteady when reaching for the worms, with a tendency to fall over backwards.

Not at regular
roost.

He had not gone to his regular roost up to a little after 5 P.M., and is evidently roosting elsewhere.

It was a great relief to find him safe and sound. He has come to occupy an important place in the affections of his friends.

October 30th.

2:00 P.M. Rhody has not been seen as yet today. Perhaps the rain, which began at about 10:30 A.M., has kept him under cover Incidentally, if we disregard the 0.06 inch that has fallen since July 1st., this is the first rain of the season.

Most of the other birds, including Brownie and his tribe, are also out of sight somewhere.

The rain lasted until about 4 P.M.

I did not visit Rhody's roost at all and he was not seen during the day, nor was Brownie, for that matter.

October 31st.

At 7:45 A.M. I could not find Rhody, but Brownie was on hand ready for worms.

At about 9 A.M. Rhody was at his observation post on the west lot, also ready for worms.

At 10:20 I went out there again. He was still there and ready for more worms.

At 2:40 he was still there, on top of the bank warming his back. When I displayed a live white mouse down on the sidewalk he came for it promptly.

At 4:55 he was already in his old roost. I had not looked for him in the meantime. (Sunset 5:12. Temp. at sunset 52 ---a cold spell following the rain).

He had not visited the cage for meat.

Rhody's attitude toward me since his serious "accident" does not appear to have changed materially, if at all, though he is somewhat more watchful of his surroundings perhaps. Possibly he remains under cover more. There is nothing definite that I can fix upon in his behavior to indicate a positive change due to his late experience. It may be that his failure to come for meat and his remaining outside the property at present is a result of that experience.

His return to his old observation point at the south bank of the west lot today may be a sign of return to normal. However, his daily habits are, in detail, always subject to variation under normal conditions.

November 1st.

Brownie heard singing about 6 A.M.

At 8:15 A.M. a visit to Rhody's tree disclosed him still in his bunk. It is a long time since I have been able to catch him in this lazy trick. Due to location of the tree the sun had not yet reached his perch. (Fair, temp. 49).

At 9:07 he was still there showing no signs of coming down. The sun had reached him, but clouds in the east were occasionally covering it.

(Note on Termites, Argentine ants, birds, based on observation of yesterday).

Yesterday I was sitting at the steps near the oval lawn--Brownie on my knee waiting patiently for me to hand him one worm at a time--11:30 A.M. "Flying ants" began to come out of the ground of the driveway at my feet--termites, I suppose. I saw them as soon as a half dozen had appeared. Their bodies were a jet, glossy black. Their wings were a dull, iridescent, smoky mother-of-pearl, very fragile. They had dug their way out from below through the solid crust. Other colonies began to appear nearby. As is usual here, after the first significant rain, these creatures invariably appear.

Brownie saw them, went down and ate a few. A hermit thrush came and ate cast off wings. Song and crowned sparrows and brown towhees joined in the feast. None of the birds were particularly appreciative of them.

At the two holes nearest me flesh-colored ("white") wingless termites, two at each hole, appeared just within the opening seeming to want to come out but fearing (?) to do so. At one hole they did not come out at all. At the other they did finally, ran about it, not getting more than 3 or 4 inches away from it, then re-entered, not to appear again. (The workers that had opened the way to the surface?). (I know nothing about termites).

The winged termites, in part, hovered about in the air nearby, the rest of them crawled around on the ground, some evidently trying (and succeeding) in getting their wings off. In doing this they fluttered teir wings violently and tried to push them off with their abdomens. Couples were now seen in tandem, head to tail, now in contact, now not, running around. Sometimes both had wings unshed, sometimes both with wings, sometimes the leader only, sometimes the trailer only. When perhaps a hundred or so had issued from each colony no more appeared. All eventually dispersed but a few here and there. They seemed to have left their wings behind them. None re-entered their holes. In a half hour practically nothing more was seen of them. All activity in

the immediate vicinity had ceased. I went to the north side of the house.

There, in the shade, the winged termites were clustered near their holes and were sluggish. I did not watch them.

The first opening from the ground is very tiny and the termites squeeze out. Since their wings are much longer than their bodies, some, due to pressure from below, are "extruded" so far that they are supported only by their wings and their legs can not touch the ground. They are stuck, wriggling frantically, seeking for a foothold. They will grasp an offered finger and haul themselves out the rest of the way.

Argentine ants in small numbers gathered to attack the termites, clinging to their wings and legs. The termites usually freed themselves. (End of this note).

At 10 A.M. I went to the western fence. Rhody was at his observation point on the bank. He remained there just long enough to show that, when he joined me at the fence, it was only because he had already planned to move in that direction long before I appeared upon the scene. Thus he saved face. Once at the fence, as long as I understood the situation, there could be no loss of dignity in reaching through the mesh and taking all worms offered. Also, when I moved to a place where there was an opening below the fence that he had frequently used, he assumed that I would not acquire any false ideas as to my attractive powers if he came through and caught worms tossed to him.

When children's voices were heard down on the street Rhody became nervous and retreated into the bushes.

I believe he stayed on the west lot all day. He was seen no other place.

About 2:15 P.M. he came down from his bank to take a live, white mouse from me, then went back again.

No attempt was made to get into touch with him during the rest of the day.

Thrasher song continued at low ebb.

November 2nd.

Rhody was still in his roost at 8:25 A.M., temp. 46. It may be that lower morning temperatures incline him to stay in his roost longer.

At 9:20 he was sitting at the top of the bank ready for worms. While catching them he frequently stretched to his full height and stared intently toward the house. I attached no special significance to this until, on returning to the house, a hawk flew out of a tree 5 or 6 yards from me and a cloud of feathers from some small bird floated down. As near as I could tell this was the point at which Rhody had been looking.

About 2:30 he was out in the street, across from his post, much interested in something in the shrubbery. A car was parked a few yards from him. I called him from inside the western fence, 50 yards away. He turned his head at once, started towardme, paused to look at the car, the occupant of which was unaware of his presence, but knew something was afoot, crossed the street, climbed the bank and came to reach through the fence for worms. The person in the car watched his approach, no doubt with surprise.

Rhody had all the worms he wanted, but did not go away. I went and got a mouse for him, carrying it so he could not see it. Nevertheless, when he saw me approaching, he immediately crawled through the fence to meet me and get his mouse.

He was not looked for during the rest of the day, but he did not come to the cage. Since his "de-tailing" he seems to have remained outside by preference. I wonder if that episode began inside and he has avoided the spot where it was initiated.

All thrashers silent most of the time, except for some sing-digging by B.

November 3rd.

At 8:15 A.M. (Temp. 50) Rhody was not in his regular roost. I doubt if the 4 degrees lower temperature of yesterday at about the same time accounts for his staying in his roost longer.

At 10 A.M. he was at his post on the edge of the bank. I approached him from the rear through the baccharis and was somewhat surprised to find him coming to meet me through the bushes despite the noise I made.

Passing in a car at 10:45, he was again on the edge of the bank admiring the scenery

About 2:30 P.M., perhaps because he had decided that I was not going to go to him outside with a mouse as I have been doing since the debacle, Rhody came home. However, Julio gave him a mouse before he had a chance to show whether he was headed for the cage or not. He wanted no more and about 3 he began to drift back to the west lot by his old route through the orchard: a foot or two at a time, scanning carefully the projected route before each move, crouching low and extending head and neck far forward. (A Sharpshin had been lurking in the trees here a few minutes earlier. These birds have a habit of concealing themselves and remaining perfectly motionless for long periods. Perhaps it is knowledge of the return of the hawks and their use of the place as coneealment that influences Rhody's present attitude toward it).

At 4:30 P.M. I found him already tucked away in his resting place for the night. (Temp. 54. Sunset 5:09, clear. Nights are getting sharp).

November 4th.

At 7:25 A.M. (Temp. 49) Rhody was still in his night roost.

Watching Rhody "get up".

9:35 A.M. At 8:55 he seemed to be considering leaving his roost and had shifted slightly into a position where he could command a wider view to the west overlooking his landing field (the street) and have a clear opening through which to take off.

He was mildly watchful, but perfectly composed. I took station at the curb opposite, about 50 feet from him and 25 feet lower. Trucks and passenger cars passed by occasionally.

At 9:05 a Brown Towhee took up a post on the limb in the ladder tree from which R jumps to his roost, watching R keenly, 6 feet away. After one glance at him R ignored him. The towhee jumped over to R's tree and inspected R from a distance of 4 feet and left in about 1 minute. R, after one look, paid no further attention to him. The towhee left. 9:11

At 9:25 I got tired of standing up, so sat on the curb. Almost immediately Rhody sailed down at a steeper angle than 45 deg., landing on the sidewalk below the tree, opposite me.

First a shake, throwing off a cloud of dust, illustrating again how these birds keep themselves saturated with dust, since he had had no opportunity to renew the supply since late the previous afternoon.

A second shake sent out another cloud. He was now ready to see what I had to offer and stepped out into the street, looking carefully up and down it to see if the coast was clear.

Next he evacuated his bowels completely--the usual early forenoon behavior of these birds, then came across to me with raised crest to catch worms. This was a new place for him and he did not altogether like it, so he returned slowly to the west lot, pausing to warm his back at intervals. At 9:30 he was at his observation post on the bank (after I had chased a cat away) prepared to accept all offerings . (Temp. 53, clear, calm. Sunrise: 6:38. Actual sunrise later here on account of hills to the east).

At this temperature one is perfectly comfortable in the sun. when there is no wind.

At 10:35 he was still there as I drove by on the street. I stopped, got out and invited him to come down for worms. He accepted.

At 11:40 still there. I called from the fence and he came for worms. When I left he followed along the fence a way until he reached his passageway beneath it. Here he stopped and booed twice, but would not come through.

At 12:55 he was again at his post, but was extended no invitation.

At 1:45 I arrived at the western fence just in time to see Rhody desert his post and seek refuge under an isolated bush and scan the heavens. A low-flying accipiter (I could not tell whether Cooper or Sharpshinned) was scouring the neighborhood for prey.

Most birds remained in seclusion, including Rhody and Brownie, the rest of the afternoon, although Brownie would come carefully out of the bushes for a worm and then retreat quickly.

I waited at Rhody's roost until nearly sunset, but he did not appear. (Sunset 5:08, temp. 57).

November 5th.

At 7:45 AM Rhody was not in his roost, nor was he in either of the two known alternatives. (Temp.49.)

No song from Brownie, but the thrasher to the south was singing well at this time.

Rhody was not at his post up to about 9:15 when I left to get Mr. Brock's barn owl and liberate him in the country. We took him out near Lake Chabot and let him go.

On returning via Seven Hills road in Castro Valley, mockingbirds were seen. On stopping the car one alighted in the road 20 feet in front of it and caught some insect.

About 2 miles nearer Lake Chabot another was seen.

Returning here at 11:30, all birds in concealment, an Accipiter flew from one tree to another. I followed him and knocked him down with a BB rifle, but could not find him in the thick bushes.

Rhody was not seen to occupy his place on the west lot, but was located near the Fish house, where he was given a mouse.

November 6th.
A.M.

At 7:45, (Temp.49) Rhody was not in his roost.

At 9:00, on looking over the fence to see if he was at his post, a hawk was seen on the ground under the bushes about 25 feet from R's usual post. I got glasses to be certain that it was not Rhody and shot him. It was a Sharp-shinned hawk (Accipiter velox). Examination for old wounds convinced me that it was the one I knocked out of the tree yesterday.

1:30 P.M. Another hawk just flew out of the oak by the front door. An hour ago, when I returned from an errand, I found Rhody down by the Fish house. As I gave him worms a red-tailed hawk and an Accipiter circled about overhead, Rhody watching them keenly with raised crest, head first on one side and then the other, but not missing a single worms tossed to him from a distance of 3 feet. An hour or so before that another Accipiter was lurking in one of the trees by the house.

Brownie still keeps hidden away someplace, so do most of the other birds, especially the quail under "every" bush. Rhody seems to think the neighborhood of the Fish house the safest place. There are no trees of any considerable size about it, only shrubbery. It is in the open and R's view of the sky is unobstructed. My place has too many trees to be really a good place for a roadrunner to be safe from hawks.

Rhody was not in his regular roost at a little after 5 P.M.

November 7th.

Rhody was not in his roost at about 8 A.M. (Fair and warm; forgot to take temp.)

At last he has decided to come to the cage for meat again. (About 12:30 P.M.). After this a visit to the Scamell lawn, worm catching and inspection of the west lot from across the street, followed by decision to go over there to his old post. This may mean a return to normal , and I shall not be surprised to find him in his regular roost this evening. (1:30 P.M.).

5:20 P.M. I looked for Rhody in his roost at 5:05; he was there. (Sunset 5:06, Temp. 62).

November 8th.

Rhody was in his roost at 8 A.M.

Still there at 9 A.M. (Temp. 57) with no evident intention of coming down; so I left and did not look him up again until about noon, when he was at his lookout. He came to the fence at once and, when the worms were all gone, waited patiently for something more without moving in his tracks. So I got him a piece of meat the size of my thumb. When he saw me coming he crawled under the fence, up the wall supporting the road, "ooked" and gobbled the meat, then back through the fence again (to get out from under the trees of which he appeared suspicious (?) and I don't blame him. He still hung around there as if expecting something more, so I called him and he crawled under the fence again and flew

up to the top of the wall to where I stood. I then tried to induce him to follow to the mousery at the other end of the house, but he would not follow and seemed fearful of his surroundings, though he is perfectly familiar with them. This attitude perhaps reflects his recent narrow escape or else fear of the hawks.

When I returned with the mouse he was again outside the fence in the open, but again returned and ate the mouse, going back to the bushes on the west lot.

He was not seen inside again during the day.

At 4 P.M., thinking that his unusually heavy repast might have satisfied him for the day and thus caused him to retire early, I went to his roost. He was already safely installed for the night. (Temp. 63, sunset 5:05).

Brownie missing. I have not been able to locate Brownie or Nova for two days, but the thrasher to the south was singing this morning. Hawks?

November 9th.

At 8:30 A.M. (Temp. 54, no wind, sun shining on Rhody's roost) that animal was still in his night roost.

At 9:30 he was at his observation post at the top of the bank and would not come to the fence to get his worms, so I compromised by going to him.

He stayed there or thereabouts all of the forenoon. Some time between 2 and 3 P.M. he visited the cage for meat, as witnessed by the absence of three large pieces of Hamburger and the presence of his k-shaped tracks in the sand spread about the dish for the purpose of recording his unseen comings and goings.

He could not be found in the vicinity of the cage at 3 P.M. and although the hearty meal indicated that he was probably finished for the day, and was probably on the way to his roost, I did not expect to find him there, but I went nevertheless.

At 3:15 he was already at his third position in the ladder tree, and at exactly 3:25 he landed in his roost for the night. (Temp. 64). It was bright and sunny, windless and mild. In fact hot on south exposed banks. Certainly there was nothing in the weather to account for his early roosting. The logical explanation seems to be that he really had nothing else to do for the rest of the day, since he had satisfied his appetite, and anticipated that the amount eaten would carry him through to the morrow.

Brownie and Nova still absent. Nothing was seen or heard of either of these birds during the day. Hawks? There is. of course a possibility that they may have a nest elsewhere. Brownie has had 2 very much out of season nests here so far; the second one resulting in nothing but a sleeping place for the winter.

November 10th.

Rhody's roosting period. Rhody came down from his roost at exactly 8:45 A.M. It is possible that he would not have come down so soon if he had not seen me standing across the street and been reminded of worms.

Here is a case where we have the exact length of time spent by him in his roost, viz: 17 hours and 20 minutes.

(Temp. at 8:45, 53. Bright and sunny, somewhat windy). (It is chilly in the wind. See comment of Nov.4th. on sensations under same temp. conditions without wind).

Between 1 and 2 he got his meat at the cage. At 2 P.M. I found him back at his post. On call he came for a mouse.

Being otherwise engaged, I did not check up on his roosting time.

Nothing seen or heard of Brownie or any other thrasher today.

November 11th.

Rhody came down from his roost at precisely 9:05 A.M., land-beside me. As he was about to have a worm a chow dog appeared, causing him to run off at great speed.

A few minutes later he was at his post, where I gave him worms.

About noon, still there, more worms.

At 2:30 P.M. still on the west lot--more worms. He wanted only a few and though he had had neither meat nor mouse, showed signs of wanting to go to roost. (By dusting thoroughly and wandering off in that direction.

At 2:44 exactly he jumped from the ladder tree to his roost. This, I believe, is the earliest roosting time observed.

(Cloudy, temp. 64, no wind. Sunset 5:02).

Assuming that he will not leave the roost today, he will have been out of his roost but 5 hours and 39 minutes today. He had evidently had all the food he required. There are still plenty lizards, grasshoppers, crickets, etc. to be had.

No Brownie all day.

November 12th.

At 8 A.M. Rhody was in his roost. (Temp. 55, bright and sunny).

Brownie returns. At 8:45 I whistled for Brownie, and to my delight, the truant appeared at once and jumped to my hand for worms. I believe this is his longest absence in 4 years, but only the notes can tell. (I do not know that he has actually been away, of course; but certainly he has been unfindable during this period).

He was extremely concerned about what the bushes and trees might conceal and, when a flicker flew overhead, dashed headlong into the bushes.

Rhody in night roost 18 hours 58 min. After watching nearly an hour, Rhody at last sailed down from his roost at precisely 9:42 A.M. Thus he was in his roost just under 19 hours (18 hours 58 minutes). I doubt if this is his longest continuous occupancy of his night roost; since he has been seen to stay in it as late as 3:30 (?) P.M. (Past notes will show).

On coming to me he was animated and buoyant: raising and lowering crest and tail, displaying skin colors and apparently much interested in everything going on without being wary or furtive.

He fully understands the significance of my hand movements as related to worm-tossing. When he sees that I am about ready to flick one toward him, he becomes visibly smaller: he sleeks down his feathers--he "contracts" automatically as he watches my hand, prepared to snatch the worm out of the air.

About 10 I again called Brownie while seated near the oval lawn. He appeared in the driveway, but would not run down the middle as is his wont. He kept carefully to the fringes of the shrubbery, moving a foot or two at a time and scrutinizing care-

fully each bush and the branches of the trees under which he passed. He then made a long detour through the bracken to avoid coming into the open and approached me from the rear where he could keep under cover. No doubt fear of hawks. When he left me he dissolved into the bushes and, a few minutes later, was heard singing in the glade, which he had somehow reached without being seen in the open.

Then followed several hours during which his under-song was heard almost constantly, full of variations.

R seeks shade at temp. of 70.

About noon (temp. 70) Rhody had sought the shade near his lookout post.

About 2:30 I drew up in my car at the curb where he sat at the top of the bank. He came down when I talked to him and stood by the running-board "inspecting" the car. (Probably really curious about the multiple reflections of himself seen in the hub-caps and the body finish. He was very "cute" about it.

A car stopped along side. R retreated up the bank, but stopped at the top as if to note proceedings. I tossed worms up to him, which he caught expertly, bringing forth exclamations of delight from the occupants of the car, who wanted to know what he was and all about him. He does not appear to be afraid of strangers when they are in a car. After they left I got him some meat. When he saw me returning he whined repeatedly and came to take the meat from hand. If he was hungry (as he undoubtedly was, as he took to good sized pieces) why did he not go and get it from the cage? And why does he not forage actively instead of hanging about on the west lot all day?

It looks almost as if he were actually denying himself food intentionally.

~~His long period of rest in his roost and decrease [illegible] at this season~~

His increasing tendency to go to his roost early and stay there late and his apparently decreasing tendency to wander far from here, together with what I believe to be an absolute decrease in food requirement, all seem to correlate with the approach of winter. Yet, as far as weather conditions are concerned in inducing these tendencies, there has been so little change from summer that weather alone seems a negligible factor- especially temperature. (At this moment, 10:05 P.M., outside temp. 62).

Maybe he is at a point in his annual cycle that harks back to the time when his reptilian ancestors hibernated, and his present behavior is a feeble recrudescence of that habit.

I gave him the meat at about 3 P.M., but did not watch his going to roost. I drove by at 4:10 and he was stowed away for the night (Temp.70). I do not know how long he had been there. It is evident, however, that temperature is not the determining factor in the time of his roosting.

November 13th.

Rhody did not come down from his roost until 9:56 A.M. This morning a duplicate of yesterday's. [illegible]

At 2 P.M. R was still on the west lot, from which he does not appear to have strayed.

As he had not come to the cage for meat I decided to take him a mouse. At 2:25 he was sitting on the edge of the bank as if waiting for me. Before I could hear him I could see his bill opening to give his pathetic little whine (mew, cry, call). To see what he would do, I walked by him 50 feet, then turned up into the

brush on the lot, approaching him by a flanking movement. I found him already half way to meet me. I gave him his choice of mouse or meat. He elected the former. Then followed long bill-wiping, dusting in preparation for the night (though there was no dust on the sun-baked earth) a brief stroll along the edge of the bank (to admire the scenery) then straight to the ladder tree, through which he passed in about 15 minutes by his invariable route, in the regular number of moves. He landed in his roost at 2:54 P.M. (Temp. 72, sunset 5:00, windless).

He was thus out of his roost less than 5 hours during the day (4 hrs.58 min.).

I should have stated that he added a soft bill-rattle to his other greeting.

By looking at him from below at least one new tail feather can be seen emerging from the lower coverts.

It certainly seems to be something much more potent than weather conditions affecting the present behavior of this bird: something innate --an ancestral inheritance impelling him to longer periods of rest with the passing of the (astronomical) summer.

As to his not coming for meat though proven to be hungry: Perhaps, since his de-tailing episode, he has been acute enough to observe that it has not been necessary and that if he waits long enough, I (being what he has discovered I am) will take upon myself the obligation of saving him from starvation. In other words, he has deciphered a new pattern of mine and "inacts" accordingly. (Brownie home).

November 14th.

A light rain began to fall about 8 A.M.; nothing of consequence As the day bade fair to remain dull whether or not it rained, it seemed a good opportunity to observe Rhody's reactions insofar as they concerned his rising time. (Temp. 57)

Two hour watch on Rhody on dull morning.

9:15. Rhody, in his roost, shifted slightly to a more open perch. No wind or rain, dull, temp. estimated "about" 60.

9:56. Raining slightly, but striking of individual drops on roof of car can be counted separately. Rhody shifts 2 or 3 feet into denser canopy of tree.

10:08. Sky brightening, sun's disc observable, but no distinct shadows cast. R hard to see.

10:09. No rain drops audible on roof; sidewalks dry.

10:12. Brighter , mild, no rain, R remains in denser foliage, cannot be seen from car against bright sky at about 30 feet distance. Children come with playthings and play near car and Rhody's landing spot. Dogs pass.

10:20 Children and dogs go, but remain in sight and sound. Absolutely no wind.

10:27. R stirs. Children coming back. Duller. Everything in the open dry. Children pass.

10:51 No changes in meantime. Cars pass frequently, about 20 (?) feet from R horizontally and 30 (?) by shortest distance.

11:06 Rhody, without preliminaries, sails down, bright and

resilient in appearance, raising and lowering crest and displaying skin colors. I remain quietly in car. He does not come to me, but walks about observingly, runs out into Selborne Drive (away from me) and defecates, turning to observe results as is his habit.

11:10. He dashes up bank and into the brush of west lot. Wrentits begin to scold.

11:13. I go up into brush to see what tits are scolding. Find brown and spotted towhees and one hermit thrush with them. Rhody is, of course, the object, but I can not see him anywhere.

11:20 I give up and turn to leave. A thump behind me, with rustling in the thick carpet of dry leaves ~~behind me~~ announces Rhody's intention not to be overlooked. He comes to me to get worms. He undoubtedly was up on a branch of one of the oaks.

11:25. R has eaten all the worms and I leave. He comes out of the brush to take up his post on the bank. (Temp. here 59).

On this occasion Rhody remained in his roost apparently for 20 hours and 12 minutes continuously. The only way to prove definitely that, when he goes to roost, he stays there until he gets out of it for good and all is for me to go to roost with him and stay there as long as he does. However, my atavistic impulses are not strong enough to induce me to resume--even in the cause of science--the arboreal habits of my remote forefathers.

. . . .

2:50 P.M. At about 1:15 I decided to look up Rhody. He had not been to the cage for meat. He was not at his post. It was still overcast, but not raining. (Temp. 60).

I climbed the bank to his roost tree on the chance that he might have gone to roost early, but he was not there.

However, precisely at 1:22, while I was still looking up into his tree, he jumped across from his regular take-off point in the ladder tree and landed in his roost just over my head.

For 20 minutes (until 1:42) I tried to induce him to come down by offering worms, meat and a live mouse, and while once or twice it looked as if he would succumb to temptation, he stuck where he was. This seemed to be pretty good evidence that he had made his last appearance for the day. About 1:45, as I left him, it began to rain slightly. Maybe he is also a weather prophet!

Assuming that he had retired for the day, it will be seen that he was up only 2 hours and 16 minutes

November 15th.

The rain yesterday amounted to only a trace.

This morning opened bright and fair. Considering the fine weather and the fact that Rhody retired very early yesterday and (as far as I know) had but a few worms to eat, I reasoned that he probably would get up early, but not earlier than 9 A.M.

Here is the evidence:

9 A.M. : In his roost, no sign of getting up, temp. 59.

10 A.M. Still in roost.

11 A.M. " " " , but I decided to wait nearby to time him.

11:31 A flock of 20 or more bush-tits invaded R's tree.

11:32 He sails down, landing 6 feet from me, much interested in the world, which he appeared never to have noticed before. Very cocky and jaunty and more intent upon sunning his back and looking at the

scenery than in me. However, he did not neglect to catch all worms tossed to him though he was rather casual about it and would not put himself out to retrieve any of my wild throws.

It will be seen that my reasoning was at fault, for he got up later than the day before. Perhaps I should have reasoned that because he had (presumably) had little to eat the day before, there would be little waste accumulated in his system so that there would be lacking one incentive for getting up. (Rhody, Archie and Terry never foul the vicinity of their roosting places; also on the present occasion R was not seen to evacuate during the few minutes I remained with him.

R in roost 22 hrs. 10 min.!

From the time he went to roost yesterday until he came down this morning exactly 22 hours and 10 minutes elapsed!

He remained at or near his post at the top of the bank until I called him to the fence to get a mouse at 1:30 P.M. I did not look him up again today, but he did not come to the cage.

November 16th.

A heavy fog blanketed everything until about 1 P.M. It seemed likely that Rhody might stay in his roost until the fog lifted, bearing in mind also that he had been well fed.

He was in his roost at 9:45 A.M., but at my next visit, 11:30 he was not there and not in sight anywhere. I searched through the brush calling him in an ordinary tone of voice, but no sign of him. When I came out into the open, a backward glance showed him following right behind me only 6 or 8 feet away, ready for worms.

At 1:30 he was still at his post and was invited to the fence to get a mouse. He hung around for a time, then resumed his lookout, and was not watched further during the day.

November 17th.

At sunrise this house was in full sun, but everything below blanketed in fog, including therefore, Rhody's roost.

I deferred looking him up until 9:30. He was not in his roost. Search in the vicinity of his lookout amongst the scattered bushes in that vicinity disclosed him about 4 feet up in a bush and 3 feet from my elbow. He had not made a move or a sound and finding him was virtually an accident.

I handed him one worm at a time. The branch he was sitting on was so small that his big feet could not clasp it firmly and he had to depend for stability upon the support of his (now) flimsy tail. Consequently, in taking worms, he had to be very careful not to disturb his equilibrium. He therefore reached for them gingerly, and, instead of gulping them with a toss and a rapid forward thrust of his head as is customary, he omitted both movements, substituting for them a pointing of his bill to the vertical, opening it momentarily and letting gravity start ~~it~~ the worm in the right direction.

In this location I could study him at reading distance. I have once or twice suspected that the brassy ring about his pupil was interrupted where it thins out to almost a hair line in front of the pupil, but was now able to observe that this effect is caused by minute flecks of brown (the color of his iris) upon the ring.

About 11 A.M. when I looked for him at his post, Mrs. Scamell called to me that he had just been chased away by three dogs, who had followed him into the bushes where she could here the chase going on.

I went up and searched thoroughly without results until, reaching the open, I found that he had again followed me out.

At 1:30 he was on a low branch of a tree deep within the tangled growth of the west lot, but came out on call to get a liberal helping of hamburger.

At 2:32 he made his final jump to his roost.(Temp. 66, sunny, without wind, but a dense sea of fog below). (Sunset 4:57, sunrise 6:51). Rainfall to date (Oakland) 0.76 in.; normal 3.20).

November 18th.(Sunrise 6:53, sunset 4:56).

Bright and fair at sunrise.
At 9:15 (Temp, 64) Rhody was still in his roost.
At 10:20 I stopped by his roost and noted that he had shifted slightly as if about to get up.

At 10:22 (Temp. 6[illegible]) he sailed down, landing near me, but immediately going off into one of his riotous dashes in and around the bushes with wing flappings, tail spreadings (as much as can be accomplished with three feathers!) and theatrical poses. He is full of pep. When he calmed down he was ready to accept worms , but even this act was dramatized with much "lip-smacking" and "tasting". I say lip-smacking because the act was accompanied by a"fleshy"sound--not snapping. He was not very hungry and soon tore off in another series of evolutions, gradually subsiding and taking up his observation post as I left at 10:32.

Perhaps the warm morning had something to do with his animated behavior, but still it did not inspire him to get up early.

At the present time I can not see that his roosting and "unroosting" times correlate with anything precisely.

I have made a special form of shelter for him which I shall put up in his tree and see if he will adopt it in inclement weather.+ In making it I have given consideration to his likes and dislikes as far as I understand them, or think I do. (Maybe it will scare him out of the tree).

The house was put up in his tree about 1:30 P.M. at about the same height as his roost and about 3 feet north of it.(temp. 76).

At 3:15 P.M. R was already in the third position in the ladder tree when I arrived. When he reached his usual take-off point 15 minutes later he scrutinized his objective more thoroughly than ever before; probably on account of the house. At last he decided to risk it and jumped, and after a little hesitation, went over to inspect the new phenomenon. Next he tried sitting on its porch for a minute or two, examining everything deliberately. He moved off a foot or so toward his roost, but seemed still to conside what to do about matters. Finally he went to his favorite spot and settled comfortably. (3:45). At least he was not frightened away.

Brownie is again remaining either away or out of sight most of the time--a complete change in his behavior. Nest elsewhere?

+ See photo, p 1291A

Experimental Shelter for Rhody.

(See notes, p.1291)

These pictures were taken while the shelter was resting on a box,which formed no part of the structure, before being placed in the roost tree.

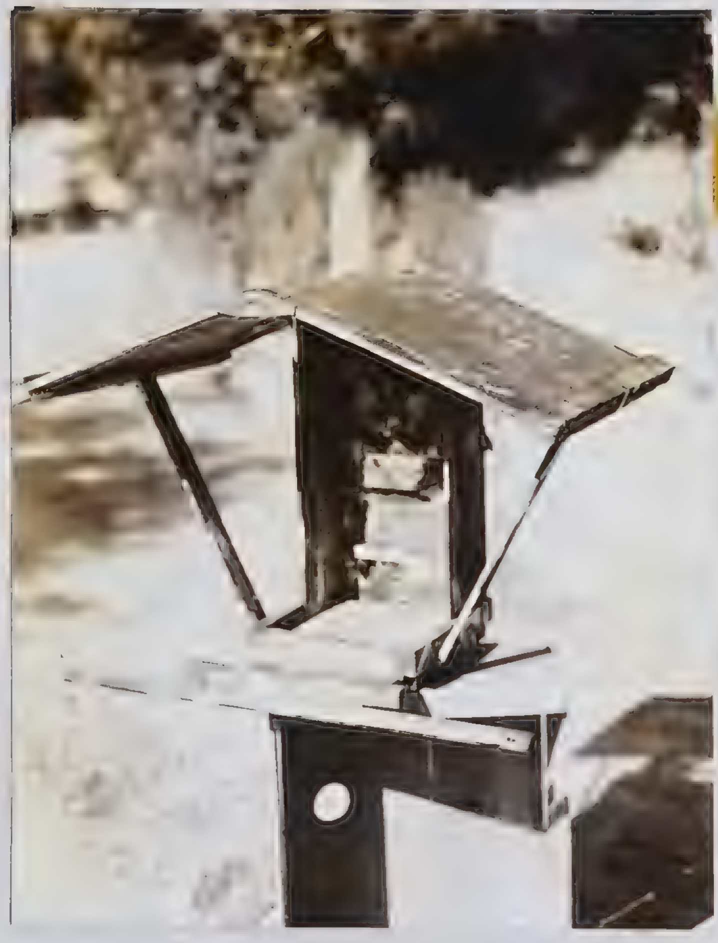


Fig.1.

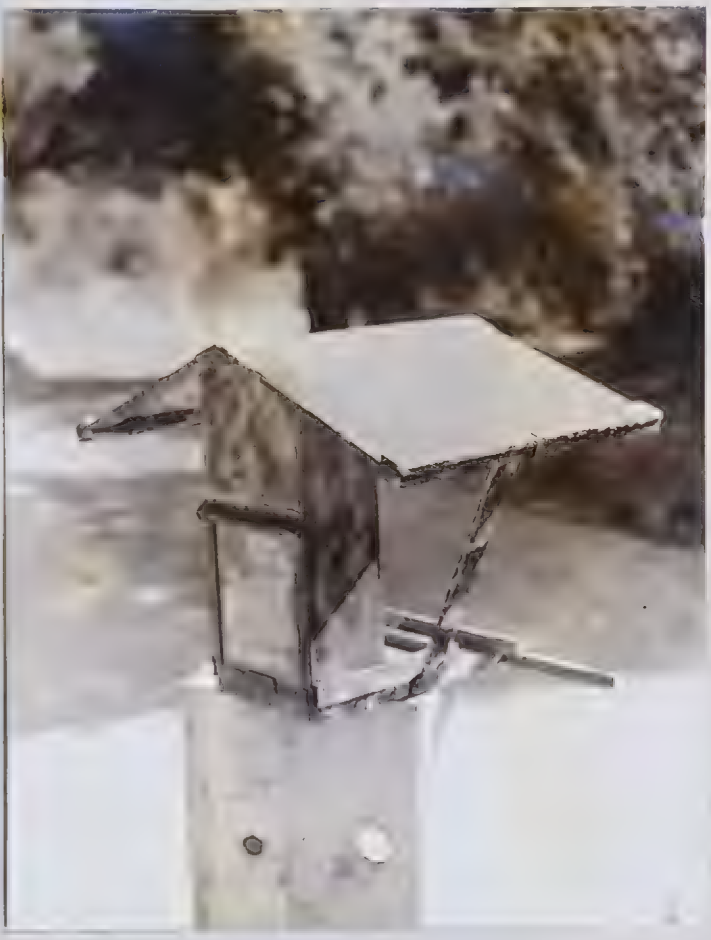


Fig.2.

As will be seen, the house is very open, the idea being to give the maximum of protection (from the rain principally) and yet create in him no sense of confinement. At the same time it was intended to protect him from the rear (from wind and enemies) but give him an almost unobstructed view in all directions. Tail support was also an essential feature, as was also shelter from upwardly trending winds, a certain amount of shelter from side winds also prevention of wind working underneath his feathers as he lay on the platform. There were further considerations affecting the design, as will appear later.

Fig. 1. shows the house to consist of a small platform for him to lie upon, with a rear wall and two narrow side walls The platform has a low parapet surrounding it--low so that he can spread his body feathers out over it and keep wind and rain from the floor and from getting under him. The whole is surmounted by a roof of wire netting impregnated with cellulose acetate:"Flexoglas". It is, therefore translucent. Its upper surface is dotted with splotches of green and brown paint--also white-- to make it inconspicuous from above (hawks) and, from below:both on R's account as well as that of casual passers by, more or less resemble the canopy of the tree within which it was to be placed and not cast heavy shadows. It is braced by two diagonal struts for stiffness. (The roof would be flexible and crackle in a wind otherwise)

The narrow side walls make it possible for him to thrust his head out and look to the rear. There is a window in the rear wall, also splotched sparingly with paint, so that he can look through that to the rear without showing his head. (See Fig.2.) The window has a bar across it inside to keep his stern and tail off of the cold glass and avoid their getting wet in the event of leaks.

Experimental Shelter for Rhody, (Cont.).

The sidwalls also keep the wind from getting at his tail from the side.

The floor of the platfrom has holes bored at the four corners to let out any rain that may enter. On top of this floor is a "super" floor scored crosswise (See Fig.1.) with deep grooves. These grooves give further drainage and are , moreover, so spaced a as to enable him to get a firm grip in the event of his having to get out in a hurry.

A perch is arranged in front for convenience in entering and leaving.

The whole affair is camouflaged with dabs, streaks and splotches of white, green and red paint and "no paint at all".

Figs. 3 and 4 below camouflage of struts (3) and effect of roof painting from below.(4).

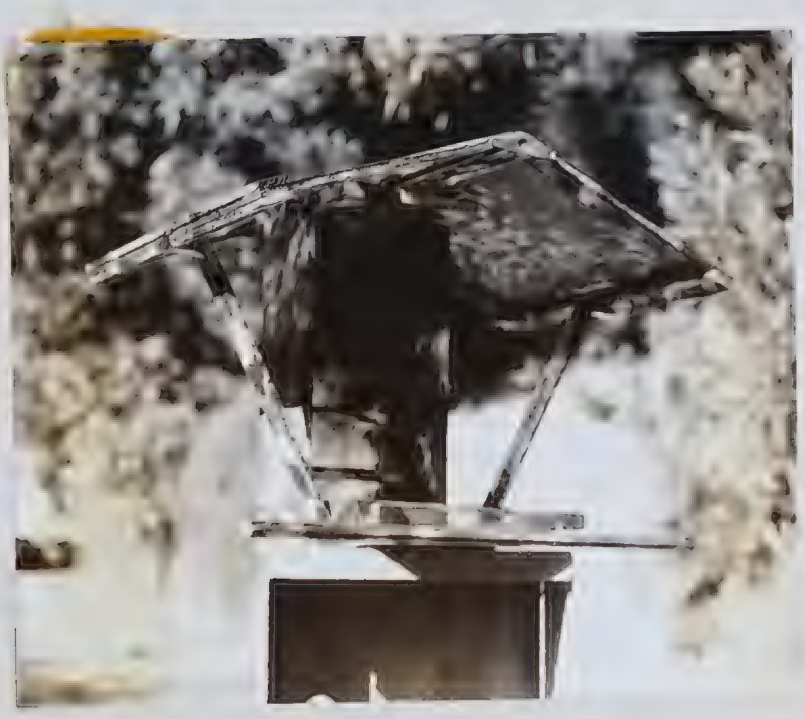


Fig.3

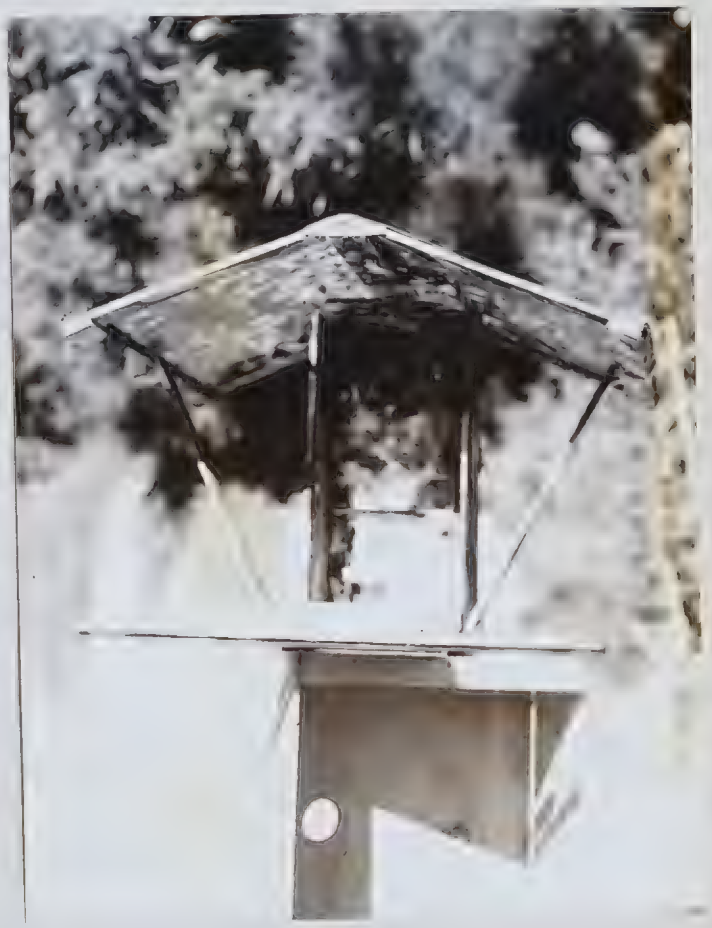


Fig.4.

(Note, July 1937: Notes susequent to Nov.18th.,1936 and to date, show that Rhody adopted the house for his sleeping place in all kinds of weather and that he surrounded the bottom platform with one of his 1937 nests).

November 19th. (Sunrise 6:54 A.M., sunset 4:56 P.M.).

At 8 A.M. Rhody was sitting close to his house in the roost tree, having shifted slightly from his regular roost. (Temp.60).

At 9:10 A.M. the tree was again invaded by a large flock of bush-tits. This caused R to move about, occupying successively the porch and the roof. He seems to have no fear of the house.

At 9:11 he sailed down. Whether a coincidence or not, this is the second time he has been observed to come down a few moments after the arrival of bush tits. The other time was on the 15th. These two times are the only occasions on which these birds have been seen to enter his tree in a flock before he was up.

Rhody was again cocky and lively, and, while friendly and tame enough, did not want worms at all, dodging those tossed to him and refusing to pick them up. In a few minutes or two, after warming his back, during which operation it was noted that his new tail feathers are 3 or 4 inches long, he went down to the street, evacuated, craned his neck to observe the results, then crossed the street to sun his back at the curb. Here, again, he refused worms, and I left him to investigate the thrasher scripping several hundred yards off to the south east.

This proved to be Brownie, who made a long sailing flight to meet me near the entrance, in the street, and eat worms from hand. He was very excited about something, scripping and calling quilck. He came from the Reynolds-Robinson territory. I would not be surprised if he had a nest there, although if he should have, presumably he has no offspring as yet, since he carries away no worms. On the other hand, and this is more probable, the supply of natural food may be more abundant where he goes.

Rhody was given a mouse at 1:30 P.M. when he came to the fence. (Yesterday he had one at noon). On neither occasion did his retirement seem to be advanced in time because of his being fed.

Time of his going to roost today was not observed, but it was later than 2 P.M.

November 20th. (Sunrise 6:55 A.M., sunset 4:55 P.M.)

At 9:15 A.M. (Temp. 60) Rhody was in his roost. (Sunny, calm)

At 10:30 he was still in his roost. As I thought it probable that he would be getting up soon, I went up the bank and sat beneath his tree intending to wait there until he decided to renew his daily inactivities at ground level. He may have had a similar idea in regard to me, for he proved to be in no hurry.

He sat comfortably on his perch clasping two small, horizontal parallel branches in each foot. These branches were separated an inch or two, thus increasing his stability and, at the same time, giving him some semblance of a platform upon which to rest his body. His tail was well supported by twigs.

My presence appeared not to influence his behavior at all, other than that a few times he turned his head on one side and looked at me with one eye. He was about two feet from his house and had shifted a few inches from his 9:15 position in order, apparently, to get a little larger proportion of sun through the foilage.

His feathers were puffed out slightly; he yawned occasionally; stretched once; dozed frequently with closed eyes, but, for the most part, his eyes were open and he reacted slightly to extraneous events, such as: especially noisy and fast passage of cars on the street below, sudden sharp sounds made by carpenters building houses a couple of hundred yards away, calls of surveyors on the street, passage of large birds, etc. "Sudden" sounds only.

At 11:45 he moved over to his house and inspected it inside with apparent interest for 10 minutes, and

At 11:55 launched himself from its porch in a soundless glide to the street, proceeding from there to his lookout on the bank. There he sunned his back for a few minutes and was but slightly interested in worms, catching them, however, with an air as if it were only to oblige me, and not hesitating to turn his back and ignore me completely. (Temp. 68).

Brownie was again called from the south east territory where he was heard scripping about 9:30 A.M. This time he was not excited when he arrived.

At 1:45 I decided to take Rhody a mouse. He was at his post, but came quickly to the fence to reach through and take the animal. The mouse proved tough and once R threw it away in sudden alarm as if it had bitten him. He picked it up, shook it by the back of the neck and swallowed it hastily, still kicking. He seems to be pretty confident that a mouse can do no damage inside, and , to swallow it, is the best way to prevent injury to himself.

Rhody now came back to me (because I was on the easiest route to the place where he wanted to go) acknowledging my presence by coquettish flirts of his tail, then dusted (a bedtime symptom), tore off in one of his looping , sidewise-running, tail and wing-spreading evolutions through and around the bushes, with pauses to confront an imaginary enemy. A happy and contented bird, unless I am much mistaken. I hurried to where I could command a view of the roost and ladder trees. At 2:08 he was already in position 3 and, at 2:11, made his last move to the roost. The quickest action yet seen. (Temp 68).

His "working" day was, therefore 2 hours and 16 minutes. The question naturally arises: If I had not happened to take him the mouse when I did, when would he have gone to roost?

If this were a strictly scientific investigation, obviously I should withhold gifts of food and see what he would do about it; but it is not, except in that events are reported precisely as I see them.

Rhody, I believe, is to a certain extent, a spoiled bird. He is undoubtedly eating less than during his more active season and possibly is counting upon my furnishing that. He does not come to the cage for meat now and sticks to the west lot most of the time. In fact, since he was last reported at the Fish place, I have not seen him more than a couple of hundred feet from the roost tree.

November 21st.

Rhody was observed in his roost two or three times during the morning up to about 11:30 when I took Messrs. Grinnell, Delacour and Moffitt down to see him . Two of us went up the bank and stood below him without disturbing him. His rising time was not noted, but he was at his post on the bank about 12:30 (?) when my visitors drove by in their car. He was a little shy, but

caught one of the worms tossed to him in their presence. (Temp. about 60, hazy sun, calm).

At 1:15 P.M., when he saw me approaching he greeted me with a whine and came promptly for his mouse.

He was not looked up again until 2:25; he had then already been in his roost for an unknown period of time. (Temp. 61, sunset 4:55, sunrise 6:56).

No Brownie today.

November 22nd.

Heavy fog early in the morning, lifting about 11 A.M., at which time Rhody was still in his roost.

At 11:30 he was at his post on the bank, came down to the sidewalk and, instead of coming to me, ran past and up the walk more than 100 yards, and climbed an acacia. A diversion from habit perhaps caused by the sight of four children approaching his post from the west 75 yards away at the time he retreated.

He remained in this acacia until 1:50 P.M., coming down then perhaps only because I showed him a mouse. By 2 P.M. he was back at his post on the bank of the west lot. 12 minutes in which to sun his back, chase a grasshopper in a half-hearted manner, dust and walk to the ladder tree saw him in position number one. Position 2 he occupied for 30 minutes. At 2:48 he was in his roost (Hazy sunlight, mild, calm, temp. 60).

He appears to have been on the ground during the last 24 hours less than one hour, even if we assume that he came down from his roost immediately after I left him at 11 A.M.

November 23rd. (Sunrise 6:58, sunset 4:54).

In the upper, thin portion of a fog this morning; clearing about 10:30 A.M.

Rhody up at 10:55. A hawk somewhere nearby in the trees. R keeping watch for it and even going into the thicket in order to locate it (?). I watched him at this for half an hour. He alternately preened and peered intently in all directions through the bushes with theatrical poses.

He is now removing the sheathes from his new tail feathers and wing coverts.

At 1:$\overset{15}{45}$ he was given a mouse and proceeded by gradual stages to the ladder tree, where he arrived in position No. 1 at 1:32. As the sun was weak he took the opportunity to warm his back frequently. He proceeded to position 2 and there, for the first time, varied his standard procedure by returning to the ground. I interpreted this to mean that he wanted to sun himself some more, since it was shady in the tree. Following him, I found him sunning in the open.

At 2 P.M. boys approaching me to speak to me caused him to retreat at great speed, heading for the ladder tree. There he proceeded at once to the take off point, but did not take off until 2:14; presumably because he found it warm and sunny at that spot. (temp. 60).

B still absent. Brownie was not seen all day.

November 24th.

Again in the upper portion of a fog this morning, clearing about 10:30 A.M.

At 10.20 A.M., as it was still foggy, although the sun could be dimly seen, I thought Rhody would surely be in his roost; but he was not, and the thermometer was down to 48.

He was not at his post on the bank either, so I looked through the brush and found him sitting quietly on the ground in a secluded spot ready for worms. When I went out into the open he soon followed, opening up to catch the sun on his back and preen when the sun came out at 10:30.

Each of the new feathers had to have work done upon it in removing the "cellophane" from the base of the quill and everything required oiling. He really has a bigger job on his hands now than when he is moulting, because there are more of his most important feathers growing out at one time than ever before. (I should think this would make him eat more).

He nibbled the nipple of his oil gland, beginning at the tip of his bill and extending the operation all along the gape, ~~at each time~~ then rubbing his cheeks and ear coverts upon the gland vigorously. In doing this his ear coverts are erected like brushes, and probably perform that function as his next move is to rub whatever portion of his plumage needs oiling with his bill, cheeks and coverts. Each of his rectrices is drawn between his mandibles several times.

His new rectrices appear somewhat less than half grown, but it is impossible to judge accurately.

At 1:15 he was not to be seen, but when I went up to his present preferred loafing ground, he soon came out of the bushes for his mouse. (Temp. 60, hazy overhead, but warm in the sun, no wind). After about 10 minutes looking off over the country from the edge of the bank he headed for the ladder tree, arriving at position No. 1 at 1:32. There he stayed until 1:50 when he again repeated yesterday's first-time performance by dropping down to the ground, going out into the open and warming his back some more. I wonder what this departure from his "fixed" habit means.

No Brownie all day.

November 25th. (Sunrise 7:00 A.M., sunset 4:53).

The house was again enveloped in the thin, upper layers of a fog this morning, clearing before 10 A.M. (We are gaining on it!)

Went down to see Rhody about 10:25, finding him in his roost. He soon moved over to the porch of his new house and sailed down from there at 10:35, moving directly to his post on the south bank. As I was about to toss him worms, a man approached, asked a lot of intelligent questions and Rhody ran off into concealment.

I did not look him up again until about 1:15. He was not at his post. Further search disclosed him sitting placidly in the glassed-in portion of the cage, where he has not been seen since his accident. He had had nothing to eat from me and it may be that this temporary failure of the comissary department caused him to fall back into the same old groove after weeks of avoiding it.

At 1:37 he came down, had another piece of meat and proceeded to the glade, where his presence at once incited comments from wrentits, hermit thrushes, crowned sparrows and towhees.

He next proceeded in leisurely fashion along the path in the

orchard looking for a place in which to roost a while in the sun. This he found in a low pine where he stayed quietly until 2:15. He was inspected here by two brown towhees, a golden-crowned sparrow and an Anna hummer, none of which were at all excited about him, but seemed to regard him curiously.

A slow march, with occasional dustings, brought him at 2:43 to position No. 1 in the ladder tree.

At 2:45	"	2 .	Though this was in the shade he he settled there for a long rest.
3:03	"	3	
3:03½	"	4	
3:10	"	5	It was sunny there. For a time he sat facing away from the roost for the first time noted. This was apparently to warm his other side.
3:19	"	6	The take-off point.
3:20	"	7	The roost for the rest of the day. Seven moves in all in 37 min. (Temp. 57, dead calm, hazy sunlight

(Without attempting a complete ananlysis of his behavior during the past few days, it will be noted that there are a few unexpected and puzzling circumstances if we try to correlate his roostings and risings with temperatures only. For example: On the 20th. it was 68 when he came down at 11:55. One would expect him to leave his roost earlier on a warm morning. The mornings following were colder and he came down earlier. Also there appears to be no close parallelism between temperatures and roosting time.

This only in passing. There are, of course, other factors).

November 26th. (Sunrise 7:01, sunset 4:52).

Bright and sunny in the early morning hours with heavy fog just below the level of the upper garden and a tendency for wisps from the upper surface to rise to greater heights. These are so distinctly outlined that one can actually place himself so that it is possible to have one hand in the fog and one where there is none.

10:30 A.M. Rhody was still in his roost at 10:15. The fog, climbing the slopes from the bay, had, at least temporarily, gained the ascendency at that point.

On returning from R's roost, Brownie, the truant, came out of the bushes and jumped to my hand for worms. He is much averse to the open places, keeping well to cover.

12:35. Rhody was visited several times during the forenoon, each time being found in his roost and showing no interest whatever in my presence or other extraneous factors.

Rhody not up at 12:30 P.M. He was still there at 12:30 when I left him. (Temp. 58, sunny, warm in sun, slightly hazy, no wind at all).

At 1:03 he had come down from his roost and was now at his post.

An Intelligent Action of Rhody's

1:20 P.M. I have just witnessed behavior on the part of Rhody which, to my way of thinking, clearly indicates the possession of some faculty, which, if not actual intelligence, is at least akin to it. Certainly it had every appearance of an action based upon judgment acquired from experience.

These notes have, on more than one occasion, cited instances where Rhody, having partially satisfied his hunger, has followed me to the mousery, been offered a succesion of mice of progressively smaller size (each having been removed from his sight on his refusing it) until one that would "just fit the vacancy in his stomach", according to his judgment, was displayed, whereupon he accepted it at once. This happened many times. In each case his refusal was indicated by his standing patiently by me waiting, (paying no further attention to the mouse after the first glance) in the expectation that I would eventually produce one that was suitable. He would only walk away when, as I assume, he had abandoned hope of a satisfactory conclusion; but he would always return if I produced a mouse of the right size.

On the present occasion, at 1:03, I looked over the western fence, saw him at his post, called him and he came. I offered him first, one worm at a time, through the wire mesh. He made no move to take it. It was offered through the identical opening (a slightly enlarged one) which I customarily use. He was only 18 inches from my hand. I then placed several in the palm of my hand and reached a few inches through the opening. One look, but otherwise he did not budge. I added more worms without effect. He has never refused worms under any of these conditions before. He had been up a half hour or less. Presumably he had not had anything to eat, since he has not been known to forage within a half hour after leaving his roost. He should have been hungry, and presumably was. The time of day (at this season) when I have been offering him his mouse had arrived, or nearly so. (I have not been absolutely regular in this).

The "hole" in his stomach was a big one. Worms would not fill the bill. He had come to me in the expectation of getting something worth while. He was disappointed, but as he remained waiting patiently, his judgement, based on past experience, told him to be patient and make no compromise. (There is anthropomorphism for you). It was now time for me to act, which I did on my own judgment, based on my past experience. I walked off. calling for him to follow, which he did, but he would not come through the fence. So I left him and went and got a mouse all the way back to the shop.

He was waiting at the hole under the fence when I returned. I carried the mouse so that he could not see it, yet as soon as he saw me coming, he crawled through the hole (notwithstanding that he fears to pass under the trees in this part of the garden (hawks) ran toward me, (he usually saunters) jumped to the top of the retaining wall where I was, suddenly fled in panic at rustling overhead (a towhee) recovered, came back and I then showed him the mouse for the first time, although a moment before I had shown him the red patse-board box in which I had carried it. He took the mouse at once and swallowed it kicking. He waited a minute or so, still fearful of something overhead, then flew over the fence (an unusual act). He was plainly uneasy in these surroundings.

The foregoing offers plenty of opportunity for speculation, but only one phase will be briefly indicated here, and that is: his ~~apparent~~ refusal of well-liked food if it is offered in quantity (or bulk) that,apparently he is by some means or other aware , will not exactly satsfy his food requirement for the rest of the day and thus enable him to go to roost. Now it is possible, I suppose, to fill him up with meal-worms, yet, in his experience, this has never been done. Maybe he "thinks" it can not be done, or does not want it to be done, hence refused them where conditions

of time (the hour of the day) plainly pointed to something bulky, like a mouse.

In past instances mice have sometimes been too large. In the present one meal-worms were too small.

(This barely touches upon the possibilities of discussion offered by the observation).

At 2:30 P.M., weather conditions the same as at 12:30, Rhody was already in his night roost. I had not observed him in the meantime.

It will be seen that he was definitely known to have been "up" not more than 2 hours and, without question, considerably less.

Brownie did some talking today (indicating that his mate, though not seen, was probably nearby. In which case a brood is improbable, since both birds do not leave their broods, as a rule, at the same time, though there are exceptions).

At lunch outside in the cloister, Brownie, who was eating suet at one of the stations, was pleased to rspond to call and join us at the table until startled by a too suddenly moved napkin.

November 27th. (Sunrise 7:02, sunset 4:52).

Fog in the morning again, clearing gradually about noon.

I did not look up Rhody until, at 12:29, I arrived at a point on the sidewalk below his tree. He was still there, but took immediate notice of me when I spoke to him, crawled across the branch toward me, sailed down, landing in front of me at exactly 12:30, eagerly catching worms until my supply was exhausted. He then dashed off in one of his swift, ziz-zagging performances through the bushes, winding up at his post on the bank, calm and unruffled.

He had been in his roost 22 hours plus. It seems to have been my arrival that induced him to come down as early as he did. (Temp. 51. but because of there being no wind, comfortable in the sun).

1:10 P.M. I will now look up Rhody again, offering him worms first, if he comes, then a mouse.

……

Rhody came to the fence on call, looked at the worms without enthusiasm at first then decided to take them instead of refusing them as he did yesterday; but today he had already had quite a few worms (unlike yesterday) only about 40 minutes before. Perhaps he thought that this second lot added to the first would make an adequate total! I let him have a dozen more or less, then pulled out the box and showed him the mouse. He forgot all about worms, reached through the fence and neatly abstracted the mouse, giving it short shrift. There is no bowing, hrooing and tail wagging now on such occasions and has not been since it was last recorded at the tail end of his nest-building.

No bowing, hrooing and tail-wagging now.

When, if and as it reappears I shall take it to mean revival of the reproductive impulse.

His roosting time was not observed, as I was called elsewhere for the afternoon, although I had a chance to look in his roost at 2:20 P.M. and he was not there.

November 28th. (Sunrise 7:03, sunset 4:52).

12:45 P.M. Rhody still in his roost. A chilly, sunless day so far with "high" fog. No sun to tempt Rhody to come down and

warm his back. Here may be an example of weather influence. (T 51

At 1:50, weather unchanged, Rhody was still in his roost with no apparent intention of coming down, but when I talked to him, moved over to the porch of his house preparatory to sailing down if sufficient attractions were offered. I placed a white mouse on the sidewalk at my feet and down he came(at 1:53) . After he had disposed of this he had no interest in worms. He even dodged those I tossed to him.

The absence of the sun so late in the day (continuous absence) may xxxx have been an important factor in his roosting so late. (This is the first time since Oct.30th., I believe, that the sun has not been shining at this time). Yet evidence on this point to date is decidedly contradictory.

I left him at his post and returned to make the above record.

2:40. Weather unchanged. I found Rhody already back in his roost at 2:35. Therefore he was not out of it more than 42 minutes, and probably less. Considering that it takes quite a long time for him to complete his passage through the ladder tree, it is evident that the impulse to return to his roost came not long after I fed him.

November 29th. (Sunrise 7:04, sunset 4:51).

The day began as a duplicate of yesterday, but about noon, began to clear.

12:30. Warm in the sun, so went down to see how the sun theory fits in with his getting up. It didn't.

When I spoke to him in his roost about 12:20, he moved over to the porch of his house, and I thought he was going to come down; however, after a minute or two, he suddenly went back into the obscurity of his roost 2 or 3 feet away, and stayed there. This was new. While I was considering this unexpected angle two dogs appeared and sniffed at me. Soon three people, their owners. So that was it. I went away, returning in a half hour. He had not budged and his lookout place was sunny and warm. Another dog came and decided to stay with me. As his owner was not in sight I chased him away! Maybe Rhody would have come down if it had not been for the dogs. This made the test inconclusive.

About 1:30 I took a peak at him and hurried away so as to influence his behavior as little as possible by my presence.

At exactly 2 P.M. another peak and retreat showed him still there, but instead of staying on the job, he must have dropped down to the ground beneath the tree instead of sailing to the stre for, at precisely 2:01 here he came marching out of the bushes to join me. He was not going to let me escape this time without paying tribute!

I surrendered and gave him a big piece of hamburger, which he took unhesitatingly from my hand . (It is a curious fact that he rarely hesitates to take meat from hand, but often will take a living mouse only when I lay it down. His attitude toward me appears to differ according as I offer meat or mouse. I have wondered about this many times. Again, with meat, he usually retreats only a step or two, then swallows it, whereas with live mice, he retreats farther, often running away rapidly a dozen feet or more. It is as if his wild instincts were aroused at the sight of living prey--perhaps his "sporting" instinct).

Earlier in these notes I have stated that observation of Rhody, Archie and Terry did not support the statement of Dawson with reference to road-runners' infrequent drinking of water in captivity, as A and T in captivity drank often and Rhody free seemed to drink as often as other birds.

However, since Rhody has, with the waning of the year, remained for such long periods in his roost (20 to 22 hours per day continuously) and has rarely been seen to leave the west lot during the past two or three weeks and there is no water to be had there, I have wondered whether his water requirement has not also declined synchronously with his lessened food intake. (His droppings have shown no loss in fluidity however). But to return to the present observations:

After eating his meat, Rhody wanted no worms and no more meat.

At 2:11, after looking at the view and sunning his back, he discharged his faeces audibly, turning his head to observe results for a moment.

(Incidentally this act, at 2:11, bearing in mind his established practice of one thorough defecation per day shortly after getting up, offers pretty satisfactory evidence that he had not been out of his roost earlier this morning).

I now went and got a glass jelly dish of water and offered it to him. He was curious about it and interested, but wanted none It was then placed on the ground near him and I walked off 20 feet. He walked past the dish within 6 inches of it, but did not pause, passing close to me, since I was in line with his usual route to his roost. I got the dish and placed it in front of him again. Again he ignored it, dusted and, at 2:25 entered the brush en route to his roost.

I hastened to a point where I could command a view of the entire ladder tree.

At 2:27 he was already in position No. 1.
2:30 in No. 2,
2:35 " " 3,
2:38 passed through 4 to 5,
2:39½ in No. 6
2:39¾ (approx.) jumped to No. 7, his night roost. He was in a hurry, was finished for the day and knew exactly what he wanted to do. It was sunny and mild. Temp., unfortunately, over looked

He was out of his roost yesterday only 42 minutes (or less) today only about 39 minutes.
(up to 2:01 P.M. today)

In the last 24 hours, he was in his roost not less than 23 hours and 26 minutes.

Apparently he had nothing to drink today and did not want anything.

Apparently one meal was enough.
" something besides the presence of the sun in the sky is not the determining factor in period of roosting or timeof getting up or going to bed.

Apparently he believes that the Lord will provide and that, at present, I am His vicegerent, and that he, himself, is discharging fully all obligations to his fellow creatures by doing as litt as possible.

November 30th. (Sunrise 7:05, sunset 5:51).

For a welcome change from the recent gloomy weather, the sun rose in a cloudless sky.

Brownie, last seen on the 28th., was in evidence at 9 A.M., ready for worms.

At 9:45 I looked up Rhody. He was not in his roost, nor was he at his post. A prowl through the bushes on the lot also failed to reveal him, but, not unexpectedly, when I came out of the covert he was sitting in plain sight on the edge of the bank where I had looked for him 5 minutes before, busily giving himself a thorough going over with oil.

He was not all interested in the implication of my presence beside him and continued with the good work until, without warning he slunk off toward the ladder tree. Cause: Two women and a dog a hundred or yards or so away, walking toward us.

He sought seclusion near the extreme end of a branch where he blended in perfectly with his surroundings. In fact I could not distinguish him at first at 15 feet distance. His bronzy green and tawny upper parts and his flaxen belly matched the shadows and high-lights of the dark green of the growing leaves and the straw-color of the leaves of some dead twigs. Only by accident could anybody have found him.

For 15 minutes he remained there, taking advantage of the sunlight to warm his back. (Recently it has not been warm enough for him to use the spread-eagle pose).

When he came down he was satisfied with but a few worms. I left him at 10:30. (Temp.60).

Nova joins Brownie here.

No brood.

I found Brownie here singing sub-song, and, for the first time in several days, he was joined by Nova. When the meeting occurred 15 feet behind me, B greeted N with the harsh h-a-i-h not heard for weeks. There was no evidence of any kind suggesting that a brood was in existence.

From time to time I verified R's continued presence at or near his lookout up to his roosting time. It was noticeable that, while he warmed his back frequently, it was usually in partial shade under a scraggly baccharis bush. For about three quarters of an hour he lay under one of these bushes at a prominent point on the very edge of the bank. Here he was inconspicuous, yet he had an extended view in most directions.

Though he was aware of my frequent visits to the fence 30 or 40 feet east of him, he took no notice of me until 1:15, when he came to me for his food: a large piece of Hamburger. This was enough. An intermittent wind from the north now came up and was striking the roost tree. I remained to see what effect it would have on his roosting time, since the tree must have been much less comfortable than the open portion of the west lot where there was no wind and where the sun now beat more strongly owing to the wind's having blown away the last remnants of the haziness. He kept in the lee until he started for his roost at 2:03, arriving at position No. 1 at 2:05, and his roost at 2:14. (Temp. 63).

The wind may have had some influence upon his decision, but probably not much.

December 1st.(Sunrise 7:06, sunset 4:51).

A powerful north wind during the night and blowing intermittently now (9:50 A.M.).

Shortly after 9 I went down to see how Rhody was faring, hoping to find that he had availed himself of the shelter of his new

house. He was sitting on the porch with his tail inside partially protected from the wind, only. Apparently that was all he wanted. When I left he followed to his lookout on the south bank out of the wind to warm his back and catch worms. (Temp. 52, brilliant sun, occasional strong gusts of wind). He was down from his roost at 9:20.

Based on his habit of the past few weeks, this was an early rising (or coming down), and the element of food (which he presumably associates with me) at this time of day, was not of importance in governing his behavior. (He was satisfied with just a few worms)

The bright, sunny bank had been bright and sunny for two hours or so, yet he had not sought it.

No doubt he was physically uncomfortable in his roost on account of the wind. His descent coincided with my departure and my leaving seems to have been the event that enabled him to coordinate his various reflexes and act in such a way as to satisfy them.

A new stunt by Brownie.

At 10:30 I went and sat in a chair facing the oval lawn. Brownie appeared in the driveway to my left and approached cautiously watching the trees overhead, changed course to the far side of the lawn directly facing me, then suddenly launched into flight and landed on my hat brim. This being too flexible, he slipped down to my glasses and took off with a push back to the lawn again. He had never done anything like this before. I was sitting "on the back of my neck", legs crossed, with one knee nearly as high as my face, worm-box on knee. I am inclined to think that B's intention (as is customary) was to land on my knee, but overshot the mark. Perhaps, at the critical moment, my glasses flashed a beam of reflected light in his face and startled him.

Whatever the cause may have been, he quickly flew back, this time landing on my foot, climbing from there to my knee.

B's method of landing on my hand.

I do not remember having recorded it in these notes, but there is a peculiar habit of B's when coming for worms when I am standing up with hand extended. Instead of flying upward on an inclined path from a short distance away, he generally walks to a point almost directly below my hand and then flies directly upward, i.e. vertically. I do not know the reason for this, unless it is easier to make a safe landing.

Rhody fed early to note effect on roosting time.

At 11:30 Rhody was at the western fence and I gave him a piece of meat in the form of a sausage about 3 inches long and three quarters of an inch in diameter. This he broke in two by slapping it upon the ground, swallowing half. In a few minutes he ate the rest. I wished to see if his earlier rising combined with an earlier feed would cause him to go to roost earlier.

At noon and at 12:30 he was still at his post.

At 1 P.M., after a long search, he was found in the open across the street from his post 30 feet from the Scamell house. Since he might have gone to the pool in their back garden for a drink, or intended to go there, or intended to occupy one of his old roosts there on account of last night's wind, I sat down to watch him. In a few minutes he chased something through the dry stubble, caught and ate it. (Grasshopper (?)--there are many there today. This action suggested growing appetite, so I tramped back here, got a very small mouse and a piece of meat, also small, and returned, sitting 5 or 6 feet from him. He wanted neither at first but decided to take the mouse after ten minutes, without enthusiasm. This disposed of he lay down for a 5 minute rest in the open just out of my reach. (How small and frail he looks when so near).

Shade temperature there was probably 10 degrees higher than my thermometer under the oak in the court here would show, based on past readings under similar conditions. (Temp. here 61).

He now wandered back across the street and took up his old post, with no sign of going to roost. (1:40 P.M.).

At 2:40 I found him already in his roost for the night. (Temp. 61, clear and calm). Earlier rising and feeding did not cause him to go to roost correspondingly earlier, it seems, though I have no positive proof of this.

Rhody's tail progress. I judge that his new tail is about three quarters of its final length. There is no evidence that his appetite has been increased due to the necessity of renewing all these new feathers at the same time.

A tuft of five or six new quills was noticed for the first time today on his crown; so probably he lost some crown feathers in the debacle. Or it may be normal moult - ?

There was considerable sub-song by Brownie during the day and Nova was with him often.

December 2nd.

The sun rose clear, but the air somewhat smoky from forest fires in the counties of Napa and Sonoma north of the Bay, imparting a somewhat lurid tinge to the light (first noted yesterday afternoon when the cause was not known).

Brownie sang a little in the early morning.

At 10:15 (Smoky. temp. 50) Rhody was still in his roost, light breeze from the north. He did not come down when I left.

Brownie , here, and somewhat anxious to keep informed of Nova's exact whereabouts, turning his head to keep her in view and "gurgling" when with me.

The vacant space in his left wing, first observed 2 or 3 (?) years ago, has not been filled. I am now sure of it.

At 10:45, as I was about to pass Rhody's observation point in my car, I saw him standing there, so drew up to the curb without alarming him at all. I tossed him a few worms, which he caught neatly, and then left. (I.e. I left).

At 11:45, on my return from the opposite direction he was seen in one of his fits of exhibitionism, apparently for the benefit of a group of quail under the bushes near his lookout and a flock of bushtits 50 feet away on the other side of that point.

When I stopped the car and spoke to him, he calmed down and came to the bank to catch a few more worms.

About 1:25 he was not to be seen from my side of the west fence. Calling produced no results. Search inside as far as, and including, the cage failed to locate him. I returned to the west fence and called. No results. As I turned away, there he was right behind me inside the fence, looking as innocent as could be. Maybe he had been looking for me. He wanted only a small piece of meat, hung around for a bit and , at exactly, 1:47 was stowed away in his night roost. (Temp. 53).

(This inside southwest corner where he "found me" is one of

the few places on the property where there are no trees to the south and west. It is also sheltered from the north and east by the higher ground and trees. It is warm and secluded and has an extended outlook west and south. I have hoped that Rhody would consider it a better place to loaf than the west lot, but today is one of the few times I have seen him there.

There is, further, a small oak on its east side, somewhat isolated from others that I have always thought fulfills his specification for a roosting place admirably, with the possible exception that, as it is a pollard, its branches are perhaps too nearly vertical to afford comfortable roosting places.

This could, of course, be rectified. It is in this immediate environment that I think Rhody would be safest and most comfortable. And I wonder that he passes it up for the present roosting place).

When he went to his roost today, he left this spot and entered his tree where a chilly wind was blowing at the time, showing, I suppose, the force of habit prevailing over comfort. Yet he does change his habits from time to time-- perhaps not the basic ones but certainly some of the minor ones.

December 3rd.

No marked change in weather conditions from yesterday.

Rhody was in his roost at 10:15 and was not looked up again until noon, when he was across the street from his post.

On being called from the fence, he was very slow about responding and instead of coming to me directly disappeared in the brush near his roost, not coming to the fence for 15 minutes.

As a mild rebuke for his indifference I withheld offering meat until he cried for it, then gave it to him.

At about 1:30 he was not to be seen, so I searched the brush finding him sitting about 4 feet from the ground in a low, scraggly oak near the fence, but well concealed. While I stood by him, he crouched low as a hawk darted through the undergrowth. For the next ten minutes or so (until I got tired and left) he remained rigid, except for head and neck, staring with intense concentration at various points along the hawk's path. He utterly disregarded my presence 3 feet from him and had turned his back toward me.

No further observations were made the rest of the day.

Brownie and Nova seem to have abandoned, for the time being at least, their long continued absences.

December 4th. (Sunrise 7:09. sunset 4:50).

As I drove by the roost at 10:45 Rhody was still in it.

At 12:30, on my return, he was sitting at his post and caught a few worms.

At 1:15 I called him to the fence from his lookout. I wanted him to become accustomed to the place described Dec. 2nd. in the south west corner, so stood back 20 feet from the fence. He walked up and down the fence considering whether he should fly over to me, pausing at the point where I have been giving him the food.

Finally he decided to crawl under at the one point where it is possible and which he knows. This place was 30 or 40 feet to the north and entirely out of sight from where I sat on the ground in the open; but when he had once made up his mind, he ran

to it directly and came rapidly through the intervening bushes to get his meat--a piece of the size that usually satisfies him for the rest of the day at this season. However, he did not leave but stood patiently beside me. So I offered him another piece of the same size which he also took. He was therefore hungrier than he has been lately. Still he did not go, but remained with me 20 minutes more, seeming to like the place. When the time came to leave, he again considered going over the fence, but ruled against it and went back through the hole.

Then followed a slow saunter, with occasional dustings, in the direction of his roost. He has now worn a trail through the brush to his take-off point for position No. 1 in the ladder tree.

His actual roosting was not observed.

December 5th. (Sunrise 7:10. sunset 4:50). Calm, hazy sun.

I read Eliot Howard's "The Nature of a Bird's World" for first time.

(Last night I read this work for the first time. This is the first of his works I have read and with the exception of Richardson's "The Art of Bird Watching" read in Sept. 1933, and an article or two in the Encyc. Britt., 11th. and 14th. Editions (of limited scope) this represents my entire contact to date with modern literature bearing upon animal psychology (or human for that matter)!).

At 10:45 I took Mr. Cain and one of his boy scouts to see Rhody in his roost. R did not like so many people under his tree simultaneously and went stiff, remaining so as long as we were there.

Coming back to the house, I found Brownie wanted worms. As he sat on my hand and dug worms out of the box there was not the slightest sign of the nervousness which, for several weeks, he has shown in regard to his surroundings.

At lunch time, a nice three-quarter song directed my attention to Brownie under a blossoming azalea watching me for signs of an invitation to join me in the cloister. The invitation given, he promptly accepted still with no evidence of fear of what might be lurking in the trees and shrubbery.

At 12:20 I went to the open space at the southwest corner, call it the Clearing, without seeing Rhody at first, but when I caught a small lizard, he appeared, flew over the fence and took it from hand, then went through the usual performance of putting it down, flirting his wings over it, putting it in another place, watching for it to run, etc. While thus engaged he was pleased to catch tossed worms nevertheless. Deserting the lizard, he now wandered about the clearing apparently sizing it up.

I picked up the lizard, (it promptly ran up the inside of my sleeve) and offered it to Rody again. He wanted no lizards and it was allowed to run off apparently unhurt.

Rhody now mounted to the top of the fence and, instead of dropping down on the other side, came back into the clearing, ran to the hole under the fence, thence into the bushes of the west lot.

At 1 P.M. I returned. R not in sight, but he soon came out of the brush, crying on seeing me. I had food for him, but he could not see it. I went to the middle of the clearing. R came under the fence and joined me. I offered in the palm of my hand a large piece of meat and a small live mouse--a problem for him. Which would he take? The mouse, knocking off the roll of meat which followed him down the slope picking up small

clods and miscellaneous trash that stuck to it. It followed the mouse down his gullet. A few minutes more of loafing inside and R jumped to the top of the fence and sat there for 10 minutes. A wider view is commanded from there than from his regular post. Perhaps he was trying it out. Whatever the motive (if any) may have been, in ten minutes more he was at his old post on the bank. (1:40 P.M., temp. 56, partly cloudy, but warm in the sun, no wind).

R goes to roost with rising temperature.

My next contact with him was at 2:20 P.M. He had already gone to his roost for the night and was sitting there with the dappled sunlight on his back. (Clearer, warmer, temp. 58). He had gone to roost on rising temperature.

B no longer nervous.

Brownie and Nova were locatable on the place whenever it occurred to me to look them up. B was still free of nervousness.

B's roosting place--an inconclusive attempt to locate it.

I have not known for some time where he has been roosting for the night; so , since he usually roosted about sunset, I got in contact with him again about 4:30, finding him in the "chaparral" on the south bank near the entrance and calling him out to get worms. When he went back in again he could be heard "talking" to Nova. Several times during the next 20 minutes I called him to me from the same place, giving him worms. Each time he returned to approximately the same spot as far as could be judged, but the growth there is too thick for the eye to penetrate. Conversation could be heard inside and a call now and then up to the time the sun's lower rim touched the horizon . Thereafter all was quiet, he would not come out again and he was not seen to leave, although it was not possible for me to observe simultaneously all avenues of departure. Julio thinks he has been roosting in a cypress tree about 75 yards to the south east of this spot. He could have gone there without my having seen him go; but examination of the tree and the surrounding bushes after I lost contact with him in the chaparral revealed nothing.

December 6th.

As I had to be absent for most of the day, I instructed Julio to see that Rhody did not lack for grub, telling him where, when and how, although he is well acquainted with that bird's present daily movements, and is, moreover, extremely fond of him.

On my return Julio said that he had been unable to locate him; but that, about 3 P.M., Rhody appeared at the cage, got meat and was then given a small mouse. This is an interesting episode, in that it seems to indicate a number of things, such as:

1. Rhody has been counting upon my appearing at his present loafing place at the psychological moment and providing him with his exact food requirement at the expense of minimum effort on his part. Hence has not been foraging actively for himself.
2. He has not forgotten about the meat in the cage.
3. He has not gone there recently because he has not had to.
4. But he has "kept it in mind" to fall back upon in the event of the Commissary Department's failure to continue its recent practice of delivering food at his doorstep.
5. That, if it was fear resulting from his recent accident that caused him to cease his visits to the cage almost completely, that fear is not now strong enough to prevail over his hunger.
6. That there is flexibility in his daily pattern permitting him to alter it easily to meet unforseen contingencies.--where previous experience has given him the necessary

"knowledge".

Though Julio's idea as to the time of Rhody's coming appears to be only a guess, it is probable that the bird went to roost later on account of this interruption of his routine.

December 7th. (Sunrise 7:12, sunset 4:50).

R up between 11 and 11:15.
Comes to meet me.

Rhody got up between 11 and 11:15; he was not timed exactly. At 11:20 I walked right past him as he sat on the bank, apparently without arousing his interest; but when I turned up into the lot fifty feet from him where he could not see me, he came running to meet me and planted himself in front of me, raising and lowering his crest rhythmically, interested and animated, but silent. Worms of course. (Temp. 51, sun just out).

Brownie, seeing me 200 yards away, comes.

Brownie at this time was scripping far off at Robinson's. I left R and walked to within 200 yards of where I judged B to be, then turned up the driveway to replenish the supply of worms exhausted by R. in order to be prepared to greet B properly in case he had seen me and recognized me by sight alone. (I had purposely not called him). 5 minutes later I found he had returned. Again

B lights on shoulder--first time.

he took the long-flight method of reaching me, landing momentarily on my shoulder. Strange that after 4 years' acquaintance he should only now venture this familiarity.

At 1:20 Rhody was discovered in that same low oak in the interior of the thicket on the west lot. He came to the fence but would not come under or over. (Not very hungry?). When I went to the fence and offered the meat he cried and took it readily enough.

R in roost before 2:40 P.M.

Looked up again at 2:40, he was found already in his roost. (Cloudy again, temp. 54).

Weather.

The weather during what is now normally the wet season, has not run true to form. To date we have had less than one sixth (0.76") of the rainfall average counting from July 1st.as is usual.

Mocking-birds at Sonoma.

Yesterday, at the Sonoma home of my old friend Judge Thomas C. Denny, I was delighted to discover that he has been keeping himself well informed on the local birds and that two mocking birds had been resident there since some time in September--the first he had seen and heard there and he has lived there more than 10 years. As we walked about the grounds I was able to verify the presence of at least two mockers by seeing them at close range. This is further evidence of the increasing number of these birds in this vicinity--this time north of San Francisco Bay. (About 35 miles N.W. of here as the crow flies).

Sun begins to set later.

December 8th. (Sunrise 7:13, clear, sunset 4:50. From now on the sun will begin to set later, but will continue to rise later).

B in full song in R's ladder tree.

1:15 P.M. (Temp.60, bright, no wind). At 10:15 Brownie was singing full song in Rhody's ladder tree, a new place for him. I called him from my side of the fence, he stopped singing, dropped to the ground, followed Rhody's usual route to me, jumped to the top of the fence beside me, thence to my hand for worms.

R up before 10:30.
Unfindable.

I went down to Rhody's roost at 10:30. Not there. I looked for him everywhere for 35 minutes--no traces.

B occupies R's territory.

Another search at 12:15 with the same result and curiously enough Brownie again came from the west lot to the fence instead of Rhody.

No Rhody.

At 1:10 still no Rhody anywhere to be seen.

B [illegible]o-sings.

Brownie had moved to the glade to continue song; this time a long under-song.

Nova with B.

Both times Brownie came to the west fence, Nova, after a few minutes, was seen coming from somewhere east.

Odd coincidence.

It is a strange coincidence that, when Rhody decides to get up earlier and absent himself, Brownie should decide to move to Rhody's preserve and usurp his privileges at the fence. (Perhaps R was still in his roost when B began his serenade and considered that the neighborhood was becoming to populous).

R found, not "on location". An exceptional day's behavior of Rhody's

Finally Rhody was out in the open near the Fish house at 2:10 P.M. He would not come to call from any distance, beginning at 75 yards and ending at arm's length. He was perfectly motionless during my approach and appeared semi-frozen.

I sat down within arm's length of him and showed him the meat. He would not move even one of his feet, open his mouth, raise c crest or "cry". (There was a sparrow-hawk on a chimney of the hous out of R's sight). He appeared intent upon something to the east.

I held the meat 2 inches from the tip of his bill, he accepted it at once and gulped it down without preliminaries and without lowering his head or moving his feet. He did not wipe his bill until 15 or 20 minutes later--another departure from form.

I waited a few minutes and offered him another piece of meat. Not wanted. I pressed it aginst the tip of his bill so that he drew his head back slightly, but otherwise did not move. This was a familiarity that I did not think he would permit. He did not want the meat.

It was 25 minutes before he moved his body at all and then only because he shifted one foot about an inch. I continued to sit besdie him watching. His interest continued to be in something to the east. (He was west of the Fish house, about 15 feet from their hedge). I thought it possible that he might be considering going to roost in their garden. In the next 15 minutes or so he shifted 3 inches to my left. Apparently to look in a direction which I had been obstructing.

It was sunny and warm in the little hollow where we were and he was not sunning his back. All he was doing was looking and listening and occasionally reacting to some sudden or new sound by starting slightly. Bees, grasshoppers and flies did not interest him, except when one or other of them came to close to his head when he would duck to avoid it.

I watched the animal at that place until 4:15. During that period he had never been farther than 5 feet from his original location. As the shadows grew longer he began to sun his back. Once he suddenly flattened on the ground and lay still. Cause: A young schoolgirl crossing the lot behind me 50 feet at the nearest.

I had decidedto stick there as long as he did because I thought this might be one of those rather rare occasions when he intended to roost away from his regular place.

At 4:15 he began to show some signs of going somewhere, prob-

ably in a northwesterly direction, since his attention had been directed more or less that way for the past few minutes and he was not so wooden. His regular roost was about 250 yards off in that direction.

He began to move slowly a foot or two at a time, always seeking the neighboorhood of something that might offer a retreat in case of need, such as a new house under construction, the various construction materials and appliances about it, fences, etc. I do not remember having seen him so cautious before .

I kept ahead of him. When we arrived at the Scamell east fence he followed north,keeping close to it, until he saw Bonzo, the dog, when he retreated, went along the south fence and turned up the west one. There he caught sight of Tommy--Leo the white cat that chased him some time ago. He reacted to the cat by cocking up head and tail pertly but continued. He now moved more freely, but with long pauses to look and listen ahead. I noticed now that children were tearing around throuh the bushes near his roost. Fortunately they left soon.

At 4:33 Rhody was in position No. 1 of the ladder tree. At 4:35 he was in his regular roost--the quickest passage through the ladder tree yet observed, though he followed his regular route through it.

This is seen to be an exceptional day for Rhody in almost every way. I do not know the reason. His rising earlier than he has been recently may have been caused by some fright. Perhaps the sparrow-hawk (who was around all day) had something to do with it. B's presence at the ladder tree may have indicated some sort of trouble nearby.

Rhody's long period of inaction near the Fish house, his failure to respond to my invitations, his indifference to my presence there and submission to the familiarity noted, his cautious return to his regular roost, his neglect of bill-wiping after meat, his attempt at concealment on seeing the schoolgirl, his retreat on seeing Bonzo (whom he knows --his salute to Tommy--Leo appears normal) his general woodenness, all may have been the result of some fright early in the day. (I forgot to mention also his absence from his regular post). This is, of course, all pure speculation.

December 9th. (Sunrise 7:13, sunset 4:51).

1:30 P.M. (Temp. 60, bright, no wind). Rhody was found still in his roost at 9:45.

At 10:40, with the aid of the tell-tale wrentits, he was located in the interior of the west lot in a little opening in the brush He was willing to catch worms provided my aim was good; but my wild tosses he let go by and would not retrieve. Clearly not suffering for food.

At 12:20 he was found in exactly the same place and had not been seen at his regular post in the meantime. This time I offered him no food and went away thinking he would follow me out, which he did. He was now careful to pick up my wild pitches.

Something interesting now diverted his attention to the west, so he had to move to a place commanding a better view. This he did with great dignity: Head up, crest raised, skin-patch displayed, tail trailing downward until the tip nearly touched the ground, all body feathers pressed tightly down, he strode off slowly in his smooth, gliding walk, without a wabble of any kind--up, down or sidewise--no lost motion whatever. Evidently important affairs of some kind demanded that he comport himself in a manner suited

to the gravity of the occasion.

What that occasion was I never found out, nor, I believe did he, for he soon took up his regular station and I left.

At 1:20 he was at his post. Calling brought him to the fence as soon as he "felt like it". He withheld his whine until he was actually reaching for the meat with open mouth.

R's whine (cry)

I have described this whine before in some detail, but forget in what terms. so this will serve as sort of a check, in part:

It is high pitched, musical, reedy, faint, audible but a few feet. To my ear it consists of two notes of differing pitch, the interval being such that there is a slight dissonance, not a perfect chord, but still agreeable. I believe a musician would say that, to satisfy the ear completely, it should be "resolved", or that the frequency of vibration of one of the tones should be altered somewhat.

2:30 P.M. Rhody is at his regular post. The air temperature (61 in the court, but warmer where he is) is such that he does not have to warm his back in the sun.

Brownie for the last few days has resumed his tactics of keeping himself pretty well posted on my movements--more like when he has a brood. Thus he "discovered" me about 9 A.M. out in the street, looked me up two or three times before lunch, and at lunch time came into the cloister to see what I could do for him. Between him and Rhody I have had to fill my portable wormery three times so far today (2:40 P.M.).

At 3:37 Rhody was already in his Position No.4. He required exactly 20 minutes in completing his course to his roost.

December 10th. (Sunrise 7:14, sunset 4:51).

A strong north wind came up about 11 last night and was still blowing at 9:50 A.M. (Temp. 54, brilliantly clear).

Wind causes R to get up earlier?

At 9:20 Rhody was found already at his post. As his roosting tree is fully exposed to the blasts, this seems to have been an occasion when weather conditions accounted for his rising earlier than has been his recent habit. In this case the wind is believed to have been responsible.

At this relatively early time of day he was prepared to catch worms, though not very hungry. Back-sunning was the order of the moment.

At about 11:40 Rhody came to the fence to eat a salamander 6 or 7 inches long, that I had unearthed while spading. (It is so dry that all of these creatures seem to be under ground).

At 1:20, when he saw me from his post, he came to the fence without being called, when I was still 50 feet or so from the fence. I had nothing for him to eat, as I had merely intended to locate him. He waited until I returned with meat then came over the fence to get it. I had thought that the salamander might be all he needed for the day, but was mistaken.

It was very warm in the Clearing and he decided to remain there for a time. It seemed a good opportunity to get some evidence as to his drinking at this season, so I got him a dish of water and placed it beside him. After a wait of several minutes he drank from it, but not thirstily, for he dipped his bill and swallowed only 6 mouthfuls in roughly 5 minutes. Still he did

drink. I do not know when he drank before.

There can be little doubt of his eating and drinking less now than during his more active season. He is rarely seen foraging. There are grasshoppers and lizards to be had with little effort on his part still. One of the former alighted about 4 feet from him while he was making up his mind whether to drink or not; he merely looked at it and watched it fly away without interest.

He stayed near me about three quarters of an hour then went under the fence into the bushes. His roosting time was not noted. The wind had ceased almost completely.

December 11th. (Sunrise 7:15. sunset 4:51. Max. in Oakland yesterday, 69. min. 45).

At 9:05 Rhody was in his roost, (Bright. calm, temp.?) but had shifted slightly to get the sun on his back.

At 9:40 he had shifted to the porch of his house. He was still there 5 minutes later when I left.

At 10:40 as I drove up in my car he was at his post, pleased to catch a few worms, then turning his back one irrevocably.

At 1:20 I set up the motion picture camera to try and get a "shot" of him coming from his post and over the fence to get meat from me in the Clearing. Naturally he chose this time to change his pattern by refusing to come at all. Instead he dusted, the customary sign at this time of day, at this season, showing that he was finished for the day; and so I interpreted it.

He now headed for his ladder tree, arriving at position No.1 at 1:35. There he remained for 18 minutes (in the shade). He now changed his mind about going to roost (3rd. time witnessed) dropped to the ground, went to the south bank to sun his back. (This was one of those days when, for me, the sun is a little too hot for comfort in its full rays and I prefer partial shade; full shade bing too cold after a few minutes sitting quietly).

I went to Rhody and offered him meat, which he took, though he had not been interested before. I waited ten minutes to see if he would go to roost, but his reaction to sun and shade seems to be about the same as mine, for he sought the spotted shade under a scraggly bush on the edge of the bank and stayed so long there that I had to leave to keep an engagement.

Brownie was much given to undersong during the day, with a tendency to plant himself in the middle of the driveway about 40 feet from my chair(where the branches of live-oaks shut out the sky) then gradually approach me in a roundabout course through the shrubbery finally winding up in the bushes three or four feet behind me and there continue his song indefinitely. There I could catch every nuance. This quarter song is exceedingly complex. At present he is often introducing the "hen motif" but with many variations and embellishments; so far as I can detect, scarcely ever twice the same. On these occasions Nova may be out of sight nearby, and while his object seems to be to make me aware of the presence of a hungry bird, it may be that he also wishes to hold Nova. (This, incidentally is not new behavior on his part).

December 12th. (Sunrise 7:16. sunset 4:51. Minimum temp. during the night 44).

Some full song by B in the early morning hours. Later: repetition of habit of preceding paragraph.

At 10 A.M. (Temp. 50, sunny, light breeze from the north) Rhody in his roost.

At 10:40, ditto.

At 11:20 he was not to be found in his roost or at his post. He was not in his other tree in the interior of the west lot, but when I came out of the brush after a search, there he was at his post sunning himself.

Temp. in Clearing vs. in the court.

At this time I found the temperature in the court (in the shade of an oak) 55. A thermometer previously placed in the shade at the fence on the west side of the clearing showed 64. This is about the difference to be expected and probably has much to do with Rhody's choice of that general neighborhood to loaf in at this time of the year.

Motion picture of R taking mouse from hand.

I now arranged a motion picture camera set-up in the Clearing, with remote control, so as to get Rhody taking food from hand.

When I was ready I called him from his post and he came readily, over the fence and to the selected area. He took a mouse but went out of the field of view with it, so I did not get that part. (12:30 P.M.) (Temp. in court 58, in Clearing 67).

Temperatures: Court vs. Clearing.

At 1:30 Rhody had retired to his present "day-time tree" in the interior of the west lot. I wonder how many times he has been there when I have been unable to find him.

His roosting time was not observed.

December 13th. (Sunrise 7:16, sunset 4:51).(Min. in night in court 45). +3°

Rhody was observed in his roost at about 9:30. He was about 2 feet from his preferred location, close to his house, head toward it and almost at the eaves and a little higher.

At 10:30 he was exactly in the same position.(Temp. in court 54, at Clearing 61).

At about 11 he had not moved at all.

At 12 he was in exactly the same position and pose.

The same at 12:30, 1:00, 1:30, 2:00, 2:30, 3:00, 3:30. At 3:30 I went up to have a look at him. I showed him mice and meat and talked to him. He seemed unaware of my presence and moved not at all. He seemed almost frozen and not entirely relaxed. An accipiter had been seen entering the trees about 50 yards from at about 3 P.M., and not coming out again.

I stayed with Rhody until 4:05, but there was no change whatever in position or pose during the 35 minutes.

At 4:45 he had shifted about 2 feet to his preferred roost and seemed fully relaxed.

While the evidence is not complete and, therefore, inconclusive it looks very much as if he had not left his roost at all.

The day was cloudy for the most part and the sun was never at strong. It was not really cold anywhere. There was no wind at all. I looked for him many times at or near his post at times other than those recorded, without finding him there. There was little chance for him to sun his back if he had wanted to do so. It is highly improbable that, if he had left his roost for a time, he would have returned to exactly the same unusual location and posture.

December 14th. (Sunrise 7:17, sunset 4:52, minimum during night 45 in court).

Deficient rainfall.

The rainfall to date is now less than one seventh of the normal.

At 9:55 A.M. (Gray sky, temp. in court 52, no wind) I stood on the sidewalk below Rhody's tree. He was comfortably stowed in his preferred spot, fully relaxed and aware of events. In response to my talk and offer of worms he made movements as if to come down, but did not. I walked away to see if he would act as if he recognized that the opportunity for getting food was passing, but he did not. At exactly 10:00 that peculiar alarm note, which quail make only when they are actually being pursued, sounded from the south west and a flock of quail pursued by an accipiter dashed out into the street about 200 feet from Rhody's roost, then back into the thicket again, the hawk turning and sailing overhead, then disappearing.

I returned to climb up the bank and stand beneath Rhody to note his reactions, especially to see if he had frozen, but, while he had turned his head in the direction of the tumult, he was not rigid and soon withdrew his gaze.

As luck would have it, precisely at 10:03, the same thing occurred as I was watching R. He merely glanced in that direction without tension and quickly lost interest. (This time the hawk chased the quail out into the open, but after the first 5o feet or so, the chase dropped down out of my sight).

(Incidentally, yesterday, Brownie showed renewed concern as to what might be concealed in the trees).

Rhody's rigidity of posture for so many hours yesterday, and his continuous occupancy of his roost, may have been inspired by nearer presence of a hawk--perhaps even an attack upon him, but, from the above two incidents, it would appear that his concern is not very great when other birds are the objects of persecution not too nearby.

At 11:30 Rhody still not up.

At 1:10 (the next visit) Rhody was wipinghis bill in the "open patch" on the west lot. He came to the fence in leisurely fashion on call, made two or three preliminary movements as if about to fly over, decidedotherwise and waited, so I handed him one medium lump of meat, which was enough. He was bright and lively. By 1:20 he had dusted and retreated into the brush.

Map of "West Lot"

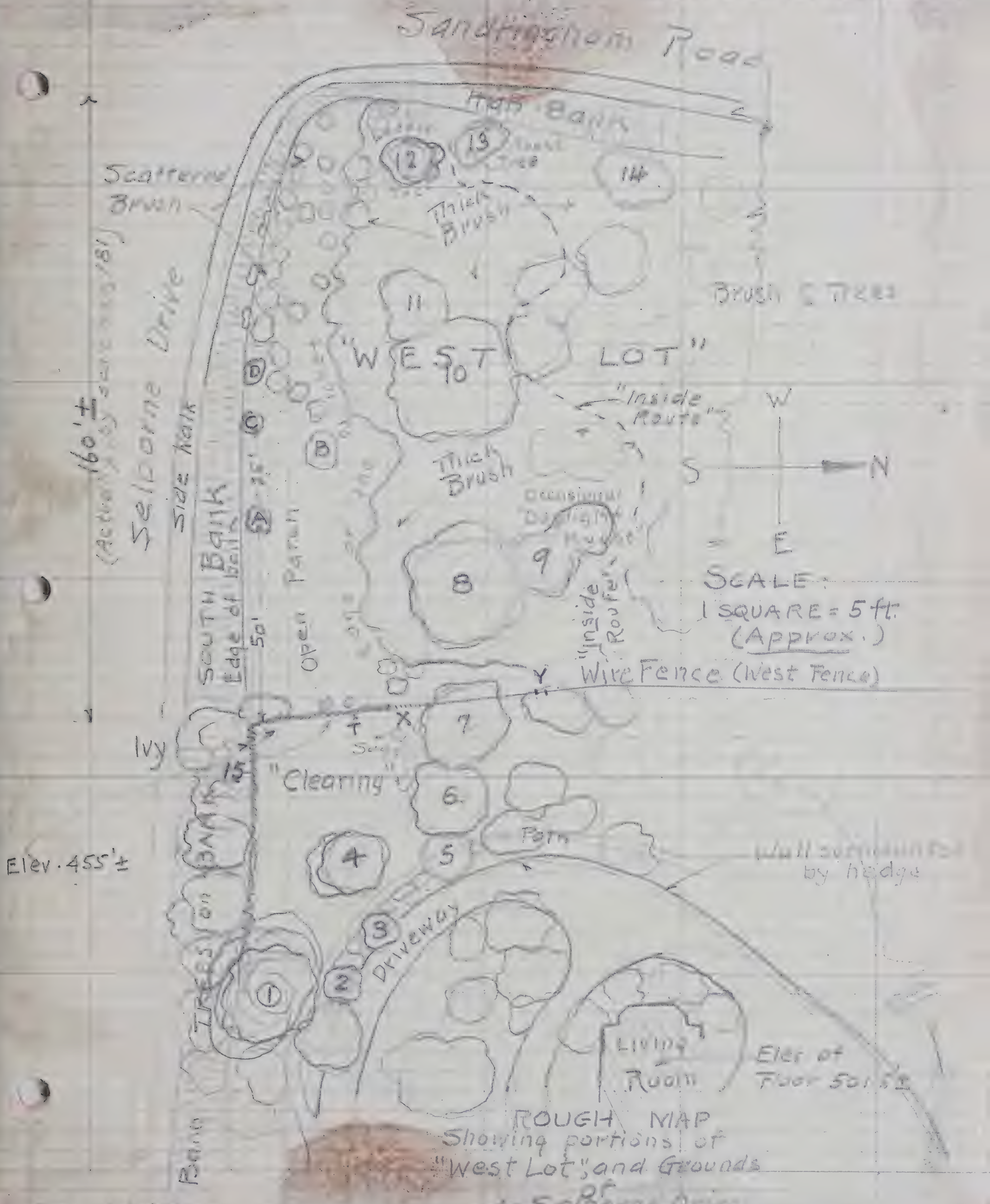
The rough sketch map, p.1313 A, shows approximately to scale this lot and the adjoining portion of the grounds of 40 Selborne Drive. The numbered trees, all live-oaks, except 1,2 and 3, are approximately in their correct positions. The others are sketched in at random. The shrubs lettered A,B,C and D are also correctly located. All the shrubs, with one or two exceptions, along the south edge of the West Lot are baccharis. The lettered ones stand by themselves. West of them they are thinly scattered. From A to D is Rhody's present "Lookout" or "Post". The bank is about 6 feet high there. The west bank ranges from 3 to 15 feet or more in heigh

Sandringham Road is on the edge of the canyon. The West lot slopes sharply to the west. From the house the ground slopes sharply to the south, west and north. The house is on a spur.

All along Selborne Drive the slope is to the west. The land south of it slopes to the south and west.

T shows location of thermometer. X (near tree 7) is that part of the "west" fence bounding the "Clearing" not covered by ivy. 9 is the "Daylight Roost Tree" recently discovered. 12 is the "Ladder Tree", 13 is the "Roosting Tree" or "Night Roost". 11 and 14 are the two trees nearest to them. All the intervening space is filled with brush up to the edge of the thicket on the south. South of that edge is the "Open Patch", covered with short, dry grass. (at present). Y is the hole under the fence.

1313 A
(See p. 1313 for explanation)


Sandringham Road
High Bank
12
13
14
Scattered Brush
Thick Brush
11
Brush & Trees
"WEST LOT"
10
"Inside Route"
W
S
N
E
(Actually 160'±)
Selborne Drive
Side Walk
SOUTH Bank
Edge of bank
D
C
B
A
Open Path
50'
Thick Brush
Occasional Daylight Haunt
8
9
"Inside Route"
SCALE:
1 SQUARE = 5 ft.
(Approx.)
Y
Wire Fence (West Fence)
X
7
Ivy
15
"Clearing"
6
Path
5
4
Elev. 455'±
Wall surmounted by hedge
BANK
Trees on Bank
3
2
1
Driveway
Living Room
Elev of Floor

ROUGH MAP
Showing portions of
"West Lot", and Grounds
of
40 Selborne Drive

Dec. 14, '36

At the present time, as the notes show, Rhody's habit when out of his roost and loafing, is to sit somewhere along the crest of the South Bank, looking off to the south, usually between A and D; mostly along side of C. Here he preens and warms his back also, depending upon air temperature and intensity of sunlight. On cool-bright days he usually does not sit under these bushes. On warm-bright days he is inclined to sit under them in order to get partial shade. On hot days he seeks denser shade, since these bushes are, during the drought, not well equipped with leaves. Also he may retreat under them, regardless of temperature, for purposes of concealment. If the menace is great enough he may retreat into the "Scattered bushes" shown at the S.W. corner of the West Lot. (There are open spaces amongst them). Or he may go into the thicket or to tree 9.

For the benefit, now, of some hypothetical , future comparative psychologist, who may see these notes and find something in them which he regards as valid evidence and applicable to his studies, I shall endeavor to describe,as accurately as possible, Rhody's typical physical response, when he is found at his post and I call him from the Clearing on the other side of the fence.

The meaning that I attach to the words used is that of everyday speech. Should any of the words have, in addition, a secondary,technical meaning in the language of psychologists, such instances are to be regarded as purely accidental, unless the psychologist, on his own responsibility, chooses otherwise, or I specifically indicate that the technical sense is intended.

However, ~~as~~ these are merely rough notes, and I do not know what I am going to say at present; but the endeavor will be as stated. It should be understood, also, that the language of psychology forms no part of my equipment and that I am , in fact, forced to use words that apply properly only to human behavior--from the psychologists' technical point of view.

Rhody's Physical Response to Call.

Note: These observations are limited strictly to the bird's behavior ~~at the present time~~ under conditions that have prevailed ~~that is to say~~ during a period beginning at about November 1st., 1936 and ending December 14th. at 1:10 P.M.

During this period there has been deficient rainfall by an extremely wide margin, an increasing amount of fog and cloudiness, gradually declining temperatures--more especially at night. Food supply has remained adequate, both because I have continued to give him meat and mice and because lizards,grasshoppers and so forth are still abundant.

Shortly before the opening of the period Rhody was apparently attacked by some animal (Oct.26.) that caused him to lose 7 of his 10 rectrices, most of his tail coverts, several of his flight feathers, many wing coverts and body feathers. This had the effect or at least synchronized with his almost complete cessation of visits to the cage for meat and coming inside the property lines.

His moult had been substantially completed; loss of this considerable number of feathers, in a sense, necessitated"re-doing" a part of the moult.

About the beginning of the period he began to go to roost earlier and come down later, his time in the roost becoming progressively longer as the days passed--with some irregularities--so that his roosting time was seldom shorter than 18 to 20 hours in each 24. Sometimes being over 23 hours, and yesterday-today believed to be in excess of 45 of continuous occupancy.

Qualitatively this roosting behavior is normal at this time of year, but quantitatively it is not know precisely how it compares with preceding years.

Following his October debacle, also, his daytime loafing places varied, but about the beginning of the period chosen, he began to use his former area in the west lot, and I began inviting him to come to the fence for food as I has done in previous years.

These observations of his response to call, therefore, refer to calls made from the clearing (See map p. 1313A) to him at his "post":generally C.

(1) What does Rhody first do when I call him?
That depends upon a number of factors extraneous to the bird himself, as well as ~~to~~ his internal state. In part the known factors or those believed to be known with certainty are:

(A) Hunger.
(B) Fear.
(C) Weather.
(D) Preoccupation.

In a rough draft like this it is impossible on the first effort to arrange all of these things in logical order or to make them exclusive. In any case it will be seen that the question as put,is not susceptible to simple, direct answer, without qualifications.

As a matter of fact, he may do any one of these things:

a. Nothing whatever.
b. Merely glance at me.
c. Look at me fixedly.
d. Rattle-boo.
e. "Cry"
f Open and close his bill and "swallow" several times.
g. Start his "circus".
h. Walk away from me.
i. Start to sun his back.
j. Continue whatever he was doing when called.
k. Begin to preen.
l. Make restless movements (Usually preliminary to approaching me).
m. Begin to approach.

See [illegible]

(Now that we have him started (in "m") be it said that he never begins his approach, from his post, directly toward me. This is not believed to have any psychological significance; he simply does not like to go through the dead grass and weeds (shown in the "Open Patch" by dots in the map). This applies to all dead grass and weeds. He wants a smoother path, and finds one;. The cushions on his feet are very soft--several referencds in these notes).

Leaving our tender-foot for the moment: it appears that in A,B,.....and a,b,c.....there are possibilities of many permutations and combinations, but no attempt will be made to work them out to the bitter end.

Going back to the main headings: A,B,C,D, these will be discussed in turn, bearing in mind that, even amongst these fourthere are shadowy lines of demarkation and combinations. However:

As to A. Rhody's primary interest in me is, I suppose, as a purveyor of food--usually mice and hamburger, but sometimes delightful surprises of lizards, snakes, birds (not often), crickets;,etc. Of course the meal-worm is staple.

What he does when I call him, therefore, depends amongst

Not Hungry. other things, upon his appetite at the time. If not hungry at all --and he is not one of these birds that is always ready to eat-- and ignoring B,C,D, as factor at the moment, he may do any one of the following or combinations of them.:

Viz: a,b,c,d (rarely),g (rarely),h (rarely), i,j,k, and extremely rarely l without or with m following.

Hungry ....What he does depends upon how hungry he is. (Ignoring B,C,and D still).

It may even be "a" for a little time at first (as if not wanting to admit to me that he is hungry--please note "as if") or as if really undecided upon a course of action. Following this, or with-a first, he may do any of the other things noted under"not hungry", and in addition e.and f.: f more often than e. In fact f is his usual response if hungry--and it is not necessary for him to see food to show it.

It seems odd that he should first do some of the things which one would ordinarily construe as signs of indifference, even when hungry. But such is the fact, although , if hungry enough, they are abandoned and approach follows shortly.

(I got off the track here, as I intended to go through with A,B,C and D first. I will come back later to especially interesting responses such as d,e,f,g.)

As to B. Fear. The effect that fear has on his first response depends upon the magnitude and the cause of the fear. Weather ties in here as a cause of fear, in the form of wind.

The observed causes of fear have to do with sights and sounds principally.

For example; sounds: Sudden gusts of wind in nearby trees, probably associated with suspected enemies such as hawks.

The voices of children at any distance.

Scraping sounds, as of a single sycamore leaf sliding along the street. Anybody dragging anything.

Alarm notes of other birds, particularly of the Brown Towhee--the greatest alarmist here, and of quail being chased by hawks.

Any hissing or sibilant sound, such as water being sprayed on plants.

Snapping of twigs and footsteps in dry leaves, perhaps suggesting the approach of predators, and similar sounds.

Noises of automobiles if nearby.

As an example of sights:

Natural enemies approaching or suspected of being about to approach, such as dogs, cats, hawks.

Children and women, especially if talking and within 100 yards and in view.

Strangers of any age or sex.

More than one person, even when one is known.

A swiftly moving motor car even if quiet and not directly approaching, though comparatively near.

The effect of fear when I call him is to cause him to fail to repond at all, or at the most to merely glance at me.

As to C. This is mostly concerned with sounds made by the wind, as giving rise to fear; but inclement weather may cause him to refuse to respond at all, and if it has been some time since he warmed his back in cool weather, his initial response on call may be to come out from under his bush and sun himself, ignoring

me until he gets "good and ready".

As to D, Preoccupation. This causes delayed response, as when he is intently gazing at some distant object, listening to something of special interest, sunning, or preening. He may then not respond for an interval measured in minutes.

(2). Granting that Rhody has now responded with one or more of the a,b,c's and has decided to come, what does he now do?

As a typical case, supposing him to be at C with no distractions observable to me, inhibiting his behavior. I am in the Clearing with the fence between us. This is a wire fence with triangular mesh. From the S.W. corner it is covered with ivy up to X. There the ivy ends. The ivy is not so thick as to prevent his seeing into the clearing almost anywhere. There is a hole under the fence at Y. He does m, that is, begins to approach, but not directly. He moves to the north, that is, at right angles to the direct line between us, a few steps at a time, stopping to look and listen, perhaps to sun his back also if not too hungry. This part of his course is to avoid the dry grass and seek the smooth course following the "Edge of the thicket" shown on the map. His progress is slow, only 2 or 3 feet at a time at first, then longer as he nears the fence and faster with fewer stops. During these stops he looks and listens, but also "studies" me as if to assure himself that I am really there, have no tricks up my sleeve, am alone and there is no hostile object near me. (I am dealing with external appearances, not trying to arrive at his internal reactions, therefore am using the language that any casual observer would use). It should be stated here that this mode of progress, unless he is in a great hurry for some good reason, is not peculiar to this occasion. It is his usual one anywhere at all times. (Of the few birds I know intimately, his economy of energy is greatest. He is almost completely free of unessential moves).

When he arrives at a point about 3 or 4 feet from the fence, he stops and watches me, often looking up into my face, as if aware that intentions may be foreshadowed there. (Like Brownie, the California thrasher). This is the effect that act makes upon one.

His nearest point of approach at this moment is not necessarily opposite the point where I am standing. It is usually where he can get a good look at the ivy-free space X, for there is the place where I have generally invited him to reach through the mesh and take my offerings.

At various times also, I have had him come under the fence at X. Within the past few days I have desired that he come into the clearing instead of staying outside. Consequently he is now generally confronted at this stage with a problem; it is, to go over the fence or to go up the hill further and come under it. In event of the latter decision he loses sight of me for a time, and has to approach me, when through the fence, by a path through the old-man sage where he can not keep me in view. (Though there is no evidence that he fears to do so).

While "considering" this problem and also, perhaps waiting to see if I will not relent and hold the food at X where he can reach it without effort, he usually f reaction and often "cries".

He now very clearly, nearly always, (Remember he has not been subjected to this test until very recently and I sometimes relent and hand him the food) shows marked indecision, evidenced by his

looking up at the top of the fence, crouching as if to spring up to it, abandoning the effort, looking up hill along the fence toward the hole, walking part way toward it, coming back and preparing to jump up, and so forth. Either route enables him to attain his objective, and he may take either, but there is an increasing tendency to come over the fence. If that is his decision ,he leaps up to the top, using his wings and sits there for as much as a minute sometimes, before dropping down on my side. If he selects the hole, he comes trotting down through the sage promptly.

During all this approach from C he may or may not raise and lower his crest and show his colored skin-patch , and he may rattle-boo, though usually not.

Now that he is inside with me he is very calm and deliberate unless extremely hungry, when he rather rushes things. Typically he places himself in front of me about six feet away and seems to listen respectfully while I talk to him and display my wares. He glances sidewise at them , then often up at my face. (I am crouching with the food in hand). It may be a mouse, a lizard or ground-up meat (Hamburger) pressed into a roll about 3" long and ¾ to 1" in diameter. Any one of them alone, or sometimes a mouse and meat simultaneously in hand. (The mice are usually tame enough to wait in the hand until Rhody is ready to eat them.)

Rhody's reactions differ for each of the tree offerings. (I am omitting here an extremely interesting reaction to mice based on their size and his appetite at the time, because the observations pertinent thereto were not made during the period under consideration, and would moreover, complicate the present discussion).

(3) How does Rhody react to each of thethree offerings: meat, live mouse and lizard? I.e. typically, not necessarily always.

Meat. He approaches quietly, without nervous display, may "cry" or say "ook, ook, ...", takes the meat and if not too large, gobbles it at once, where he stands without retreating, then moves off a couple of feet and"rests" indefinitely after vigorously wiping his bill. This bill-wiping may be renewed every few seconds, at longer and longer intervals for several minutes. Between times he suns, and/or preens, and/or stretches and/or strolls about near at hand "looking at things". (All this is radically changed in mating time).

Live mouse. He now seems more like a wild creature, as if the sight of living prey aroused predatory instincts. His approach is more cautious and furtive, he appears to sneak up, ooks more, snatches and falls short frequently, he may flirt his wings, raise and lower crest and display colors, finally he snatches it and retreats farther and faster: from 3 feet to 30. If very hungry he gobbles it without slapping it on the ground, otherwise (also if it is a big one) he slaps it. He then swallows it, stands very erect and still for a minute or so, then further behavior as above.

Lizard (live). Similar to mouse, but a new element introduced which resembles cat-and-mouse behavior. He does not kill it at once, but liberates it, ~~wait~~ waits for it to run, walking about it "pretending"
n

> not to see it, but now and then casting sidelong glances at it. (The lizard "plays 'possum invariably, which supports Rhody's game). When and if the lizard bolts, R is after it like a flash. If it does not, he incites it to such action by picking up by a foot or the tail. This may go on indefinitely and the bird may actually abandon it without eating it or killing it even; though ~~he~~ he usually eats it. (This "play" is much intensified during the seasons when R is not hunting for a mate, not needing it for young, and not staying for such long periods in his roost). Thus now it is not so much in evidence. In the other seasons it is either used as a lure for a prospective mate, given to her, or fed to the young).

(4). What does Rhody do after this? (Still bearing in mind: under present conditions).

At present, and for a few weeks past, this bulky food, in contradistinction to meal worms, has usually been offered after noon, generally, though not always, about 1:15 to 1:30, this being considered advisable due to the fact that he may now go to roost as early as 1:30. If his intention is to go to roost soon after this meal, he dusts and gradually works toward the"ladder tree" through which he climbs then jumps across the intervening space to his roost. Otherwise he returns to his post or to tree 9 until just before his contemplated roosting time, whatever it may be, then dusts and completes the ~~calling~~-feeding-loafing-roosting cycle for the day.

Now going back to the responses d,e,f,and g: These have already appeared many times in the notes and been described. I do not know what incentive lies back of them or what thier purpose may be.

(d) The rattle-boo. A very human-like boo!, like that of a child trying , in play, to frighten somebody, but combined with a rattling od the beak. It seems to be, at any given time, one of the following; according to circumstances.

A greeting, a contact call, a warning, an alarm call, a summons (as to a mate), an intimidation act, an expression of surprise, fear or perhaps pleasure or anger. A sort of "omnibus" call, not at all unpleasant and varied in intensity.

(e) Thus far, as made by Rhody, a greeting or call for recognition or for food and only heard addressed to me and no other living creature. When brooding his young and he saw me approaching he kept it up until I handed him something to give the babies. It is a sort of mew like a kitten's or a whine, thin and of little volume, two toned-slightly dissonant-but pleasing; has a pleading quality--and that may be the motive back of it.

(f) Opening and closing bill and swallowing movements. Instigated by the sight of food or the food bearer. In terms of the comparative psychologist (to depart momentarily from the policy of this memorandum) perhaps an example of the conditioned salivary reflex of Pavlov .

(g) The "circus" of which numerous examples given in these notes. A ridiculous tearing about through and around bushes and other objects in loops and other complicated curves, with spread wings and tail, theatrical gestures, peek-a-boos with imaginary colleagues on the other side of an obstacle, raised crest, displayed colors, with or without sonorous rattle-boos and general irresponsible behavior, perhaps play, or exhibitionism or exhuberation of

spirits, or plain damfoolishness. A delightful performance, sudden and unexpected, sometimes involving considerable distances (in the hundreds of feet) and subsiding as suddenly as it began, the performer calm, unruffled and appearing absolutely unconscious of having just played the clown.

(4) What does Rhody do when offered meat and a live mouse simultaneously? (This should logically have been included in (3). Under present condition he chooses the mouse and his behavior is the mouse-behavior above described. (At other times he has not always chosen the mouse, as the notes show).

.... (End of this memorandum).....................

Continuing with daily observations:

4:55 P.M. Rain began to fall--a cold one, temp. 50.

December 15th. (Sunrise, if there had been one, 7:17, sunset 4:52)

Rain during the night. Light drizzle , 9 A.M.

At 9:30 I went down to see how Rhody had reacted toward his new house in the tree. He was not in it and was in his preferred location. When I talked to him he showed interest and moved to another place about 2 feet away. Raining slightly. I walked away to see if he would then come down. He did and ran toward me with raised crest, took station on the bank (here 3 feet high) facing me and ma_ed once. He spread his wings out horizontally. This is the reaction to unaccustomed rain. He was rather wet outside, but when he shook the moisture off, dust with which he keeps his under plumage charged, floated off, showing he was only superficially wet.

He was very eager and alert to catching worms, quickly retrieving my bad shots. (Recently he has been letting them go). He shook water from his tail with a series of waves from base to tip. Occasionally he would spread his wings and let them hang down as a turkey-cock does when strutting. Very pretty and animated, especially at this close range (2 to 3 feet), perfectly at ease and without fear. Soon he tore off for a short"circus", then returned. I left him there at 9:40.

On my return to the house, Mrs. Scamell, whose house is just across the street from the Clearing, and had not seen Rhody and me a few minutes before, telephoned to say he was out at his post and had gone back into the bushes, suggesting that he might have returned to his roost.

11 A.M. At about 10:30 I went down to look up Rhody. Neither in his roost, at his post, nor in tree 9. Search through the wet thicket revealed nothing until, turning to look at my back-trail, there he was right behind me, slim and wet, but looking unworried and expectant. I produced a big piece of hamburger. He cried, advanced with a series of soft ooks and in a matter of a second or two it joined the meal-worms of 9:30.

Note reversal of behavior of the last few days, such as early rising (in reponse to my presence) and early heavy feeding. (Temp. in court 45, in clearing 49 : but these can not be accurately correlated with temperatures on dry days, because the bulb s are wet. They are really "wet bulb" temperatures).

12:20. Still raining slightly. Rhody was in his daytime roosting tree, No.9. at 12 noon. (Temps.: Court 47, Clearing 51, bulbs wet).

On the south side of the spur which forms the backbone of this place and which dies out in the west lot, one would not

Tree 13 an uncomfortable selection.

realize that there was any wind at the present time; but, immediately on turning the corner (S.W.) of the west lot, one encounters an unpleasant, chilly breeze of which R's night roosting tree (13) gets full benefit. As far as shelter is concerned, this tree is one of the worst he could have selected, and I wonder that he does not change it in inclement weather.

Tree 4.

Tree 4 is the one I would select as best fulfilling his requirements if it were not for the fence and the upright habit of the limbs of the tree. (It would be much handier for me!).

R's first and second choice of trees for nest in 1935.

It is now possible to point out on map, p. 1313A, R's first and second choice of nesting site for 1935. Tree 3, a Catalina Ironwood (Lyonothamnus diversifolia) was his first choice and tree 8, a live oak, his second. Both were abandoned. Tree 1, an Acacia Baileyana, was considered by him

At 1:30 P.M. Rhody was found in a new place: part way down the bank at tree 13. He wanted no food. I watched him for 30 minutes, thinking he might produce another "first" by climbing directly up the roost tree instead of going up via 12. Though I was pretty uncomfortable--not being dressed for the situation--I was encouraged to watch as long as I did because of his performing a very thorough oiling operation, causing me to think that, in rainy weather, this might be substituted for dusting and that oiling might, therefore, be an indication of his intention to retire shortly thereafter. However, he stuck it out longer than I did, so nothing was learned in regard to this conjecture.

Mr. Feltes' observation on roosting road-runner.

A letter just received from Mr. Charles Feltes of Modesto tells of finding a Say Phoebe and a Road-runner after dark, roosting in an old deserted cabin in Lone Tree Canyon on the 13th. inst. The road-runner had its tail flattened against the wall-boards in the manner of Rhody, Archie and Terry. He had used up his flash bulbs elsewhere, so could not get a picture; but to quote: "And a picture it was too, for the manner in which that road-runner had spread out her feathers & she looked for all of the world like a miniature peacock". He left without disturbing her.

(Note possible violation of Rhody's canons re choice of roost).

Passing by at 3:30 it was noted that Rhody was in his roost, having ignored the house. (Light rain).

December 16th. (Sunrise 7:18, sunset 4:52). Rain threatening, cloudy at sunrise. Rainfall this storm very little.

At 10:15 A.M. Rhody, still in his roost, though willing to look at my offerings, would not come down as he did yesterday. Weather conditions were substantially the same, except, that, the disagreeable wind was not present. He, perhaps, was comfortable enough where he was.

(11 A.M. A hawk or hawks raiding).

About 8 A.M. Brownie was singing intermittent full-song. Yesterday the same (in the rain). Also extended periods of subsong.

At 12 M, sun breaking through, Rhody still prefers his roost.

At 1 P.M., sun in and out, temp. in Clearing 61, court 55). Rhody at bush C, preening and sunning, would not respond to call. So I went to him. He would not meet me any fraction of the distane between us, but when I dangled a mouse under his nose, grabbed it at once.

Mr. Feltes' road-runner.

I have arranged with Mr. Feltes to go with him to the cabin tonight where he saw the road-runner roosting and if it is still there try to catch it and bring it here.

December 17th. (Sunrise 7:19. sunset 4:52). Day opening bright.

B sings a little.

A few phrases of full song from B about 8 A.M.

Rhody already up at 10 A.M.

At 10 A.M. Rhody was already up and at his post. I went out in the street to interview him, but he was gone when I reached the place. (Temp. in Clearing 54).

Brownie, however, came out of the bushes to get worms instead, curiously enough, appearing at Rhody's bush C.

R in tree 8.

Search for R located him, with the aid of a pair of wren-tits, in tree 8, on the sunny side.

These birds now deserted him, crossed the tree and began scolding me within four feet of my head, then left.

Brownie who had been sounding a few calls from 13, now discovered me again and wanted more worms. Neither he nor R seemed aware of the presence of the other.

Catching a Road-runner.

Catching the Road-runner in Lone Tree Canyon.

Mr. Feltes and I reached the the agreed meeting point near the entrance to the canyon within a few minutes of each other, both ahead of time. Pitch dark, open country, no landmarks, no signs.

We went up the canyon. The "deserted" shack was occupied by sheepherders and guarded by dogs! No use looking in there for a road-runner~~s~~. This is an almost treeless country, but Mr. Feltes said that, further up the canyon there was a windmill with two pepper trees near it, and, a little further some large tobacco trees. We might possibly find a road-runner roosting in one of them. A forlorn hope. However, we examined the pepper trees with our flashlights and in the second one, the flaxen belly of a road-runner, about 10 feet up, appeared amongst a tangle of dead branches and twigs, impossible to reach from the tree itself.

From my experience with Rhody et al, I was reasonably certain that the bird (as it was dark) would stand a lot of disturbance before it would leave, so we hunted for something to enable us to get at him. By a miracle, somebody had ~~been~~ just been repairing the windmill and had made a short, crude ladder. This, with a lot of noise and shaking of the bird, we got in place. Mr. Feltes went up and grabbed him. He squawked and almost got away, but soon ceased struggling, was put in the box previously prepared for him and thereafter not a sound came from within.

The box was placed in Archie and Terry's cage, on a high shelf and the cover opened. The bird was tucked away, absolutely motionless, and did not come out--which was just what I wanted.

In the morning he was up in the upper annex of the cage--awnings had been drawn to give him seclusion.

I have only had one glimpse of him this morning (wishing to avoid frightening him). He seems to be a small bird. This was at 9:30 A.M. for perhaps 5 seconds, from below. When he showed fear I retreated. Julio had already placed a live mouse in a wide-mouthed bottle where the bird could see it; also meat.

At 11:35, still up there. I went in and stood below him for a few seconds, he watching me. He did not stir this time and I again left. No food touched. Warm and comfortable in there.

West Lot getting too public.

About noon a young man was seen lying on his back in the thicket near tree 9. Rhody had disappeared. I went over the fence, entered the thicket and sized up this young fellow, engaging him in conversation a minute or two. He seemed of the "collegiate" type, was courteous and clean. (Later I found he had used papers from a note book bearing upon what was evidently a "business" course. As I talked to him Brownie joined us and came to me for worms.

A little later, Mike, the tract gardenener, told me he had seen "about 2 hours ago" a boy about 14 climbing Rhody's night-roosting tree. The boy jumped down and made of when he saw Mike.

The new road-runner.

At 12:20 the new road-runner was in the outer cage. He ran around, on seeing me, trying to find an outlet, and "rattle-booed", finally taking refuge in the upper story out of sight. No food eaten.

At 1:40 R came from his post for food. He had both meat and mouse, returning to his post. (Temp. 63 in clearing).

It was not until 3:34 that he arrived at position 1 in the ladder tree. Apparently it was too comfortable at or near his post in the meantime.

This suggests that, at this season, one of the elements bearing upon his going to roost and getting up--as to time-of day--is not weather at the time in an absolute sense, but the comparative conditions of comfort which weather conditions at the time offer in two selected locations. That is: assuming his hunger to be satisfied, the time at which he seeks his roost on any particular day, depends upon whether the roost is more comfortable than the vicinity of his post. This is borne out to a certain extent by his behavior after 1:40 today. Thus he dusted right after eating and started toward the roost, but changed course and went to his post. Twice later he was seen to leave his post, dust, as if going to roost, move toward the roost, then return to his post.

He finally landed on his roost at 3:40 P.M. The above theory seems to fit in with those observations where he was seen to leave position 1 and return to the ground to sun himself some more.

December 18th.

The new RR was not seen to eat during yesterday. He will permit one to enter the cage and stand under him without flying into a panic, but is more or less frozen.

At 10 A.M. Rhody was again already at his post. He had a mouse at the fence while a visitor stood about 30 feet away watching. (Brownie took worms from this visitor's hand.-Mr. Frost).

Rhody's roosting time was not observed, but he was seen to be in his roost at 3:40 as I passed by.

New Road-runner. R5.

This bird was not actually seen eating during the day. The mouse left for him was not touched, but the meal-worms were apparently eaten by him.

He will be, for the time being at least, designated as R5, that is the fifth road-runner under observation at this place, the others being: Rhody, Circe, Archie and Terry.

R5's roosting posture (at night).

While it may be said that this bird was "in his night-roost"all day, still it was not until about 3:35 that he was seen in the typical road-runner night posture in a location evidently selected for the night. He had gone to the highest point in the upper story, was backed against the wall with tail flattend vertically against the boards.

December 19th. (Sunrise 7:20, sunset 4:53; the day is "getting longer on one end and shorter on the other").

The day began cloudy, windy and rain threatening.

R5.
Now eating?

About 9:30, as I approached the cage, R5 jumped up from the floor to his retreat. The mouse in the bottle was still there. (I.e. a fresh one, as the other one had been returned for the night to his fellows). The meat had been disturbed, but not eaten.

A can 12" in diameter and 10" deep was substituted for the bottle and the mouse transferred. A new supply of meal-worms was placed in a heap of bran nearby.

In about a half hour the mouse was gone and only one of the worms could be found. The can is one from which sluggish white mice can not ordinarily escape --in fact, on test, have never been able to get out. The place where the meal-worms were put is such that if they had crawled away, practically all of them could have been found.

A fresh mouse and more worms were placed as before, at 10:45.

At 11:30 not one worm to be found; tracks in the bran; mouse still in can; R5 seen on ground by Julio a few moments before. All meat untouched.(Each piece is definitley placed).

R not up.

Rhody had previously (10:40) been found in his night roost; windy there.

At 11:55 R5 was again seen on the ground, retreating at once to his place in the upper story. The mouse was still there. A fresh supply of meal-worms was furnished.

At 12:05 only 10 meal-worms left, none found farther than about a foot from the group and then only four. R5 was sitting lower down in the acacia branch, quietly. He had clearly moved since 11:55 and is undoubtedly eating the worms. All other food as before.

R5 behaves very sensibly now when he sees anybody approaching. If in his roost, he merely stays there. If on the ground, goes to it directly by shortest route and stays there motionless. No senseless panics, flutterings and endeavors to escape. He is coming out of concealment oftener.

At 12:25 still 10 worms; two had crawled about 18", the rest about as they were. R5 still lower (hence nearer to me when I enter) on a cross perch through the foliage of acacia branch in upper story. His tail cocked up at right angles against a perch directly above and parallel. This is sleeping posture, and may mean that he has eaten enough and retired for the day--but I doubt it.

At 12:50 I got a glimpse of R5 making two clean leaps from the ground to his retreat--not any useless movement whatever. He had eaten the rest of the worms, but not the mouse.

I had been neglecting Rhody, so looked him up at 1:15. Not at his post or roost, nor could I find him in the thicket. But when I returned to my side of the fence, he was out in open patch and came quickly on call. He hesitated between "under" and "over",

decided upon the former and came over, lightly touching the top with his feet as passed, instead of sitting there for a while as usual, floated down gracefully to land in front of me. He lost no time in taking the mouse--probably his first meal of the day. The mouse finished, he defecatedforcefully and turned his head to observe results, first from one side and then from the other. His diagnosis being favorable, his post outside now called to him. A short, quick run parallel to the fence, a quick turn to the left, a nearly vertical rise, a pat of the feet on the top wire, another float downward, the perfection of ease and grace.

December 20th.

R5's morning's droppings contain mouse fur.

He has passed critical point

At 8 A.M. R5's mouse was no longer in the can and a new one was put in.

9 A.M. This mouse has also disappeared and fresh droppings on the ground contain mouse fur, so we know now that R5 has been eating mice since his arrival here. (His first droppings after he was put in the cage contained no fur). It is a great relief to know that the bird is "breaking in" well.

A freshly killed house mouse had been put in with the live mouse shortly before 9, but it was not taken, the live one being given preference.

At 1:45 Rhody, who had been neglected all the morning, was not at his post; but he must have spotted me in the Clearing, for he suddenly appeared at the fence and flew over to get his mouse.

As a test, more to determine whether a mouse could possibly get out of R5's can, than to see whether he would eat another one, another one was putin and all the ground about the can was covered with a coating of fine sand, upon which the tracks of a mouse would show plainly and incidentally also, the track of the road-runner if he went to the can. Meal worms were put also on the sand. Presence of visitors prevented my observing results until:

7:30 P.M. The mouse was still in the can. The road-runner had walked through the sand to get the worms, but had not visited the can. He was stowed away under the ceiling of the upper annex, tail against the wall in true RR fashion.

Judging from the droppings that have accumulated, he is having a great feast.

Except the one instance reported on the 17th., he has shown no sign of panic, merely retreating promptly to his refuge whenever he sees anybody approaching. There he stays as long as anyone is in sight, frozen. Going in and standing below him does not cause him to move at all.

December 21st. (Sunrise 7:21, sunset 4:54. The shortest day in the year).

Sometime between 8 and 8:30 A.M. R5 came down and gobbled the white mouse in the can. The sand coating was covered with his lopsided k-tracks, but there were no mouse tracks! R5 had also deposited his morning's droppings, now liberally charged with mouse fur.

Apparently, unlike Rhody at this time of year, he has no inhibitions that constrain him to remain in his roost until late.

So far he has consistently refused to eat butcher's meat and dead mice. Rhody, even before he became tame, took meat that I put out in the garden for him.

4:40 P.M. I spoke too soon about R5's not eating dead mice, because, some time before noon, he ate a freshly killed house mouse that had been placed by the can this morning.

At noon another live mouse was put in the can. He must have eaten this too, since it was gone before 3 P.M. and had left no tracks on the sand.

R5 is making up for time lost, or else does not share Rhody's delicate appetite at this season.

Rhody was on the porch of his house in the roost tree at 11:15 A.M. (warm and sunny) but sailed down to me when I talked to him. He wanted but a few worms and then tore off in one of his circuses.

I looked him up again at 3 P.M. As he was coming over the fence 5 boys and 3 dogs invaded the west lot. R shot by me like a meteor headed for sanctuary somewhere in the garden, but I could not find him after a search of more than one hour.

I looked for him again at 4:30, finding him in his regular roost. Though aware of what was going on, he would not come down for a mouse. Food received from me today was negligible in quantity.

His roosting time was not noted.

December 22nd.

R5 ate two freshly killed house mice this morning. A live white mouse placed in the can was not taken today.

Rhody, ~~on call~~ sailed gracefully over the fence at 1:45 P.M. for his mouse. This time he would not leave his post until, as an evidence of good faith, I held the mouse up so that he could see it. When he reached me he gave one loud rattleboo. Now I wonder why.

His lot was later again raided by a crowd of dogs and boys and, at 3:40, he was not to be seen. (A chilly, foggy day).

December 23rd. (Sunrise 7:22, sunset 4:55). Another foggy morning.

R5 less fearful? About 9:15 A.M. R5 allowed me to approach to about 40 feet of him while he was down on the ground before retreating. Even then he took his time about going up into his hide-away, and when I entered the cage, he remained low down, in plain sight where I could have reached him easily; but immovable.

He had already eaten a live mouse

He is out of his roost both earlier and later than Rhody is at this season, and eats more.

Between 1:25 and 1:40 he ate another live mouse.

In the several dozen times I have been in the cage with him positively the only movement I have ever seen him make, besides breathing, is to roll his eyes down at me, and that only once!

Rhody was in tree 9 about noon.

At 1:30 he was on the ground in the Clearing at the exact spot where I have been giving him food lately, as if waiting for me. (And perhaps he was). He lowered his head and gave his pathetic little cry when I arrived. I first gave him meat and then a mouse. A few minutes later he was back at his post (A this time)

December 24th.

Rain during the night and again about 2 P.M.

Rhody was already up at 10 A.M. (cloudy) and in the bushes near tree 9. At 11 A.M. he had shifted to the tree itself. He wanted no food from me, or at any rate he would not come to the fence for it.

At noon he was not in sight from the Clearing. 1 P.M. ditto. 2 P.M. ditto. At 3:30 not to be found anywhere, even in his roost.

But at 3:50 he was stowed away for the night, not using his shelter. (Raining slightly).

This is the sort of day when one might reasonably expect him to get up late and go to roost early, yet he did not. When the various observations on his movements are analyzed, I will be quite prepared to discover that, at this time of year, it is the good weather that keeps him in his roost longest!

R5 rejected a freshly killed house mouse, though he took it out of the can and dropped it in the pool. It was returned to the can together with a live white mouse. The latter he ate soon. Another one, up to 4:15 was not eaten, nor was the dead mouse.

Today is the first one on which he has been seen to move with me present in the cage. He showed "signs of life" four times altogether; the first time I found him rigid as usual and talked to him as has been my custom. He began to thaw, raised his crest and tail and began to move about a few inches quietly and unhurriedly. This happened three more times. After each he appeared to relax and be more at ease and not afraid to move his head a little.

December 25th. (Sunrise 7:23. sunset 4:56).

A bright, clear morning. A little full song by Brownie.

At 10:30 A.M. Rhody was still in his roost (Temp. in court 44, in Clearing 52).

R5 had not eaten his mouse.

Rhody was not contacted again until 12:15. He was then "waiting for me" in the Clearing and cried promptly on seeing me. When I invited him to follow he did so promptly. I wanted him to find out that there was a road-runner in the cage so as to observe reactions.

I gave Rhody a mouse at the cage door--he had followed me 125 yards--and as he showed no disposition to investigate or to go away, I went into the cage and invited him to follow. This he did at once, so we were all three in the cage, but R5 was up in the annex out of sight. Rhody was, I think, unaware of his presence as I do not believe he had ever seen him.

Rhody now began to move about at random, eventually arriving at a point below R5. He then saw him, but did not seem excited. Neither did R5. R climbed up slowly from perch to perch toward R5. I stood close by to lend a hand, if necessay, to protect either bird and get Rhody out if events became too strenuous.

Rhody now went up and sat on the same perch as R5, about two feet from him. Both birds were now in such a position that it was easy to see that Rhody is the larger. They did not seem antagonistic, looking at each other quite calmly.

However, Rhody suddenly attacked R5 and pulled feathers out of him. R5 retaliated and there was a lively set-to in the acacia branch with plenty of rattle-booing, mostly by R5. They separated and R5 tried to get out through the roof. They came together two or three times more while I was trying to make Rhody come out of the branch. I finally pushed him out with hat and hands. He did not want to leave. I then got him out of the cage entirely and shut the door. He finally went off to sun himself, and about 12:45 I went to him and offered him meat, which he gladly took and continued his sunning. There I left him.

There were no marks of the scuffle on either bird. R5 did not come down while it lasted and seemed calm enough when I went in later to have a look at him. A little later, also he ate his mouse.

Rhody did not worry him from the outside of the cage, but appeared to have forgotten all about the matter, remaining in the vicinity of the fig tree in what used to be one of his favorite places until nearly 3 P.M. (The wrentits proved of invaluable assistance in keeping me in touch with him).

At 2:45 Rhody began to follow his old route through the orchard arriving at his at 3P.M. Here he sunned his back for 15 minutes, leaving only when Brownie came to investigate affairs.

R went directly to the ladder tree, but it was not until 3:37 that he vaulted to his night roost. (Temp. in Clearing 55, in court 48). Now here is a bright, clear day without wind (though there is a slight drifting of the air in from the ocean) perfectly comfortable in the sun, a little warmer than yesterday, but Rhody's roosting events were about the same both days.

At 3:50 I went in to talk to R5. He was frozen at first, but soon thawed and began to preen 2 or 3 feet over my head. (Repairing damage done by Rhody?) This is the greatest composure he has shown in my presence. I left a lot of meal-worms for him.

4:20. He has eaten the worms.

December 26th.

12 Noon. Heavy rains during the night and forenoon, accompanied by strong south-east wind. (Temp. 45).

Rhody not to be found, though I did not go into the wet brush. R5 has had one live mouse this morning and is occupying the most comfortable location on the place.

I found Rhody at 2:30 P.M. sitting on the porch of his house in the roost tree, shaking out his feathers. So he does find it useful at times. I returned to get him a mouse and found that he had come down and was in the open patch, doubtless hoping that I would have food for him. He came promptly over the fence to the clearing for his mouse, then waited beside me quietly. He was completely wet, on the outside at least, looking very slim and meek. He no longer had spots in his plumage; they had all changed to mere streaks .

His suspicions of the trees bounding the clearing on the north were now verified by the appearance of a hawk there, which quickly departed, but Rhody froze. He stood in the open with the rain streaming off of him, staring fixedly to the north. I left to get him more food and returned with a fresh, dead house mouse. He was still fixed in attitude in the same spot. I approached, offering the mouse. He would only roll his eyes slightly. I laid the mouse's tail across his bill. No movement. I stroked his tail lightly--a slight response. I stroked his back.

He moved off a foot to avoid it, but resumed his frozen attitude still staring into the trees to the north. (I had never touched his back before).

I now held my umbrella over him. He did not like this and retreated about 3 feet, resuming his former attitude. He had no interest in mice.

Thinking meat might interest him, I went and got some. No use. My persistence seemed to annoy him and he retreated to the S.W. corner of the fence slowly but with dignity. There he stood like a statue in the pouring rain. Finally he decided to return to the west lot and, presumably, his roost, though I did not follow him. To go from the corner to the hole under the fence about 70 feet away took about 45 minutes, as he moved about 2 feet at a time and studied his surroundings carefully at each stopping place. He went under the fence at 3:37, and entered the brush in the same careful manner. By the time he had gone into it ten feet or so, I had had enough and left.

There is Rhody's behavior on a stormy day, the first in many months.

I nowwent to see how R5 was getting on. He had eaten his second live mouse and perked up head and tail when I stood below him and talked to him then turned his head from side to side to get a better look at me. He is at least beginning to regard me as something not hopelessly terrifying.

He is consuming twice as much food as Rhody derives from human source--perhaps absolutely twice.

Rhody was not seen in the vicinity of the cage.

Brownie was not seen, but was heard occasionally.

December 27th.

10:25 A.M. Heavy rain at times during the night and still here, but the wind died out early yesterday afternoon.

Rhody was not in his roost at 10:15 A.M. and not evident any place in the open.

Brownie interrupted this note by appearing in the upper garden and being given worms in the cloister. His tail was the only part of him that was wet. I wonder how "he does it".

R5 had a house mouse(caught last night) about 9 A.M. Julio is catching a lot of these creatures now--some by hand, alive. R5's this morning dead.

Search for Rhody from 12:30 to 1 (not raining) failed to disclose him, though I looked through the wet thicket. However, at 1:45, I found him waiting at the fence at the S.W. corner. He flew over and ran to me instead of taking his usual leisurely course. He was given a piece of meat first, then a live mouse.

At this moment the sun broke through the clouds, and although he was still occupied in putting the finishing touches on his mouse-swallowing, he at once turned back to sun and opened up. So prompt was the respose that his neck and breast feathers were still agitated by the last struggles of his victim . He was fairly dry.

By this time R5 had eaten his second dead mouse of the day--

a small one with a very long tail, looking like one that had come in from the fields.

Though Rhody and R5 were formallyintroduced, as recorded, there seems to have been no effort on the part of the free bird to continue the acquaintance as yet.

At 3:45 I went into the cage, talked to R5 and showed him a live white mouse. He came out of his freeze with a jerk of head and tail. At present this is his standard response to my entering and standing below him.

I put the mouse in the can and went out, standing by the door of the cage, 20 feet from the can. R5 came part way down and peeped at me from below a rafter and returned. This is his first exposure of himself with anybody at the cage. I retreated to 30 feet distance. In 5 minutes he again appeared; this time on a shelf lower down and above the mouse, retreating not quite so soon. I moved off to 40 feet, still in the open. He came down to the shelf twice again. I partly concealed myself behind the lower branches of a pine about the same distance away as before. He could see me when he came down, provided he looked in the right direction, but he could not see me from his retreat.

In a few minutes he dropped down to the same shelf, looked down at the mouse and remained quiet for several minutes. He then dropped down to the ground, then into the can and out again with the mouse in his bill. He disposed of quickly while on the ground in regular road-runner fashion and then went up into his retreat.

I entered and found him, for the first time, not frozen.

He has had three mice today. I hope he has some realization of the fat time he is having and credits me with it as a partial offset to any charge which he is carrying against me in his ledger.

I wish also that he would condescend to eat some of the meat and pyracantha berries that I put out for him.

December 28th. (Sunrise 7:24, sunset 4:58, bright and fair).

At 9:10 R5 had already eaten a house mouse caught by Julio last night.

At 9:25 (temp. in court 41, in Clearing 51) Rhody was not in his roost and could not be found in the thicket; but when I came out, he was sunning his back at bush D and ready to catch worms. This operation, however, was not allowed by him to interfere with his sunning except when it became necessary for him to run after some of my bad shots.

As noted many times previously, the orientation of his body when using the "open" type of sunning, is very accurate--his initial pose, if not sufficiently precise to cause the sun's rays to impinge upon his back at the proper angle, being subject to minor adjustments by twisting his body without shifting his feet. It is seldom that he has to make more than one adjustment. There is a time interval of a few seconds between his first assumption of the pose and its rectification, due, probably, to the insulating effect of his back feathers delaying the time of arrival of the heat at the skin surface.

1:30 P.M. Rhody has just had a generous helping of meat, followed by a rather large mouse, in the Clearing. When I went out he was in tree 9 (cloudy) and cried repeatedly when he saw me on the other side of the fence, but I could not hear him at a distance of about feet. This time he ran by the hole under the fence and flew over,

R5's fear of me decreasing (?)

R5 has just had his second dead house mouse of the day. He is not afraid now to move about in the upper annex in my presence, making saucy (perhaps involuntary) gestures with head and tail and looking at me from various angles, first with one eye and then with the other, lowering his head below his feet if necessary to get a good look. This behavior gives one the impression of friendliness, though I doubt if that is its real import; rather that it is still inspired by fear but of lessened intensity than that which first possessed him. In other words: His fear of me is not now so strong that it impels him to remain absolutely motionless as a measure of protection by concealment.

Coldest morning.

December 29th. (Sunrise 7:25, sunset 4:59, sun rising clear. Min. temp. in court last night 36- the lowest of the season so far).

B singing.

Early song by Brownie--more in the nature of detached calls.

R up early.

Rattles without the boo.

At 9:45 A.M., as I approached the Clearing, Rhody rattled his beak from an unseen location. There was no voice sound accompanying it. I could not locate him at all until he came out into the open. (Temp. in court 40, in Clearing 48). He was, of course, sunning his back in the "open" pose and did not alter it as he caught the worms tossed to him.

Earlier rising.

It is to be noted that he is getting up earlier recently.

R5 had already eaten his first dead mouse of the day. (Julio caught 4 last night).

Later in the day he had another dead one and a live one. Salamanders put in his can were not touched.

I sat in the cage for a half hour. After a few minutes he moved to a lower perch where he could see me and stayed there as long as I was in the cage, "semi-thawed".

At 1:30 Rhody was not at his post, nor was he in the clearing. After a few minutes search I returned to the clearing, finding he had come there and was waiting--apparently for me--as he seems to have solved my middle of the day food--mouse--Clearing pattern, and is able to forecast its culmination without following it through in detail, just as he did the food-mouse pattern based on going to the shop-yard at any time of the day when he was hungry.

He was offered the choice of meat or mouse, choosing mouse. A half hour later, at his post, he was ready for the meat, making one faint whine barely audible at 3 feet. (56 in Clearing, 48 in [illegible] sunny, calm).

His roosting time was not observed .

December 30th. (Sunrise and sunset as yesterday).

Rain during the night and forenoon.

Brownie singing about 8 A.M.

At 10 A.M., in a torrential downpour, I stopped in my car at Rhody's night roosting tree. He was snugly tucked away in his house, well protected from the rain. (No wind).

At 11:20 he was still there (no rain) not showing any inclination to come down.

R5 had had one fresh dead mouse, but had not eaten the live salamander. [illegible]

R5 "loosening up". At 1 P.M. I went into the cage with a live white mouse. R5, as yesterday, move to a place where he could see me. The mouse was then placed on a horizontal scantling forming a part of the framework of the cage, about 3 feet below the bird. He was interested at once and showed no great fear of my approaching him so closely. I backed to 6 feet from the bird. He came down to get the mouse, cocking head and tail, colors displayed. He was not quite bold enough to take it so near me and retreated. I kept still and, in a few moments, he came down again, took the mouse, killed it and swallowed it without running off with it, then moved without haste to a little higher perch where he could still see me. I left without his being disturbed.

At 1:10 Rhody not to be seen from this side of the fence. Nor was he in his roost tree. I returned by a roundabout course to the Clearing. I reached the place where I have been feeding him, during this period, about 10 seconds before he flew over the fence and ran to me. I showed him meat first. At first he would not take it, but waited patiently, and I think, hopefully to see what else I had. (I had a mouse, but it was concealed from him).

At last he took it and gulped it down where he stood, but still waited. So the mouse was produced and quickly went the way of the meat.

Rhody was perfectly dry in appearance. It was not raining, but I attribute his dryness to the use of the house.

At 2:45, sun trying to break through, Rhody was sitting quietly in tree 9.

R5- a great mouse eater -agai eats mouse in my presence . At 3:30 I repeated the 1 P.M. experiment with R5, standing the same distance away. This time he needed no second trial. He killed it by squeezing it and was so anxious to get it down that he started swallowing it crosswise. This did not work well in spite of tremendous efforts that shook the perch. He looked for a place to lay it down and start all over, but as he was in the middle of a long slender perch, found none; so he persisted in his attempt until, finally the head slipped in and thereafter it was amooth sailing. R5 is about the "mouse-eatingest" road-runner of my acquaintance.

I then went down to see if Rhody had chosen the house for his night roost, but he had not and was in his regular place.

During a period of sunshine R5 was sunning himself in the open style appropriate to the temperature conditions prevailing at the time.

I should have recorded it before, but Rhody's new tail feathers seem to be of about normal length now.

December 31st. (Sunrise 7:25, sunset 5:00. Time of sunrise remaining approximately fixed, sunset about 1 minute later each succeeding day).

10 A.M. (Bright and sunny, 42 in court, 48 in Clearing.) Rhody not up; R5 already eaten his first live mouse of the day.

At 1 P.M. I held up a live mouse for R5's delectation. He came part way down to have a look. I placed it about 5 feet from my face. He took it with little hesitation, but dropped if accidentally and would not come lower for it. It was replaced. He came down quickly and got it, eating it without moving away. As it was sunny at that point he could not resist staying there and sunning